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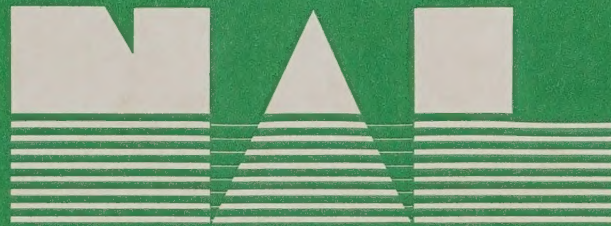
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LAND RESOURCE BASE REPORT: COSTA RICA

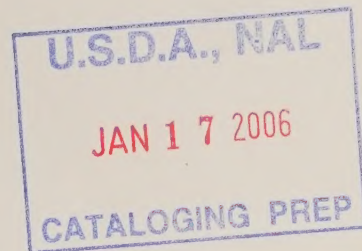
prepared by the
Comprehensive Resource Inventory
and Evaluation System Project
U.S. Department of Agriculture
and
Michigan State University
January, 1980

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Figure 3. - Resource Planning Unit Map of Costa Rica

Figure 3. - Resource Planning Unit Map of Costa Rica

FOREWORD

This Working Series report was developed by the Comprehensive Resource Inventory and Evaluation System (CRIES) project staff. Activities of the CRIES project in Costa Rica are funded under PASA #AG/TAB-236-14-76 between the U.S. Department of Agriculture and the Agency for International Development. Participation of Michigan State University is covered under Research Agreement #12-17-07-8-1955 between the Economics, Statistics, and Cooperatives Service of the U.S. Department of Agriculture and Michigan State University.

The CRIES project staff (constituted of personnel from the Soil Conservation Service (SCS, USDA), the Science and Education Administration (SEA, USDA), the Economics, Statistics, and Cooperatives Service (ESCS, USDA), and personnel from the Remote Sensing Project, Department of Resource Development, and Department of Agricultural Economics of Michigan State University) was responsible for project activities in Costa Rica. Mark Cochran, Research Specialist, Department of Agricultural Economics, and James B. Johnson, Agricultural Economist, ESCS, coordinated the preparation of information and reports for Costa Rica.

This report describes the land resource base of Costa Rica. The report is introduced by an overview of the taxonomic systems underlying the derivation of the Resource Planning Units. The Resource Planning Unit (RPU) and Production Potential Area (PPA) concepts are discussed. Methods and materials used for the soil, crop climate, and RPU classifications are reported. An RPU table for Costa Rica is presented. Supporting material also included in the report are a page-size RPU map of Costa Rica and the descriptive sheets for the map units on the soil map of Costa Rica (the latter as Appendix A).

Major portions of this report, including the RPU table, were prepared by Kenneth Ackerson of the CRIES project staff and the Soil Conservation Service, Alan Atchley of the CRIES project staff and the Science and Education Administration, and Ellis Knox, operating partner in Soil and Land Use Technology, Incorporated (consulting firm) and consultant to the CRIES project staff. The CRIES project efforts to assemble a soil map of Costa Rica were coordinated and joined with the efforts of the Natural Resource Division of the Office of Agricultural Sector Planning (OPSA), Government of Costa Rica. Ellis Knox, Samuel Perez (OPSA),

Working paper was developed by the Comprehensive Resource Inventory and Evaluation System (CRIES) project staff. Activities of the CRIES project Costa Rica are funded under PASA WAG T-8-236-10-76 between the U.S. Department of Agriculture and the Agency for International Development. Participation of Michigan State University is covered under Research Agreement #13-17-07-8-143 between the Economics, Statistics, and Cooperatives Service of the Department of Agriculture and Michigan State University.

The CRIES project staff consisted of personnel from the Soil Conservation Service (SCS, USDA), the Science and Education Administration (SEA, USDA), the Economics, Statistics, and Cooperatives Service (ESCS, USAID), and personnel from the Remote Sensing Project, Department of Resource Development and Department of Agricultural Economics of Michigan State University) was responsible for project activities in Costa Rica. Mark Cochran, Research Specialist, Department of Agricultural Economics, and James B. Johnson, Agricultural Economist, ESCS, coordinated the preparation of information and reports for Costa Rica.

This report describes a land resource base of Costa Rica. The report is introduced by an overview of the taxonomic system underlying the derivation of the Resource Planning Unit (RPU) and Production Potential Area (PPA) maps. Methods and materials used for the derivation of the RPU and PPA maps are reported. An RPU table for Costa Rica is presented. Supporting data are included in the report as a separate section. A map of Costa Rica showing the RPU and PPA maps is included in the report as a separate section. A map of Costa Rica showing the RPU and PPA maps is included in the report as a separate section.

Major portions of this report, including the RPU and PPA tables, were prepared by Kenneth Anderson of the CRIES project staff. The Soil Conservation Service, Agency for International Development and Education Administration, and the Department of Agriculture and Use Techniques incorporated

and Alfredo Alvarado (University of Costa Rica) collaborated in assembling the soil map of Costa Rica that underlies the Resource Planning Units delineated in this report.

John W. Putman, Head of the CRIES project, contributed substantially to the writing of the taxonomic discussion of this report. Mark Cochran and Weldon Lodwick of the CRIES project staff provided suggestions, based on discussions with collaborators from the Technological Institute of Costa Rica at Cartago, on items that should be included within this report to assure its usefulness in agricultural resource planning and training activities in agricultural resource planning in Costa Rica.

Mrs. Susan E. Campbell, secretary to the CRIES project staff, typed all copies of this report.

James B. Johnson
Agricultural Economist
CRIES Project
Economics, Statistics, and Cooperatives Service
U.S. Department of Agriculture

LAND RESOURCE BASE REPORT: COSTA RICA

Land Resource Classification System

Introduction

The Agricultural Resource Information System will provide the capability to explore national questions about current and potential capacity to produce alternative levels and mixes of food, fiber, and export crops and associated levels of employment, income, and foreign exchange. The land resource base assessment will provide a partial basis for assessing the comparative advantage of the various resources in the production of agricultural commodities. The information on land use will provide a partial basis for doing comparative impact analyses of alternative programs and policies to evaluate the comparative advantage in the use of the agricultural resource base.

To provide for analyses of comparative advantage in the use of agricultural resources, it is necessary that the land resources be inventoried and aggregated into areas for which reasonable, unique estimates about land use, crop adaptations, crop productivity, management practices, and development options can be made. To facilitate incorporation of the land resource information into the Agricultural Resource Information System, it is also necessary that these resource units be geographically identified so they can be cross-referenced with other information on resource use, administrative boundaries, and other information useful and essential to assessing production potential and useful for planning, policy and program analyses, and implementation.

The need for both a homogeneous resource area and a geographically identified resource planning unit require that the Agricultural Resource Information System use a two-level system of land resource classification to accommodate these information management and analytical needs. The homogeneous resource unit is called a production potential area (PPA). The unit that is geographically and

cartographically identified to facilitate information management is called the resource planning unit (RPU).

The concepts and definitions of PPAs and RPUs reflect the relationships among soils, climate, and plant growth. Soil resources are stratified according to the U.S. Department of Agriculture's Soil Taxonomy. Agroclimatic characteristics are classified according to the U.S. Department of Agriculture's "Crop Climate Taxonomy." The basic precepts of each taxonomy are discussed as a prelude to discussing the derivation of the production potential areas and resource planning units.

Agricultural production requires the presence of naturally-occurring factors such as soil, temperature, water, light, and many others in the general proportions needed by plants. These many interrelated factors are frequently grouped into two components -- soil and climate -- to simplify the problem of estimating the impacts of the environment on the adaptability and vigor of economically important plants.

The interrelated nature of soil and climate in the physiographic and biologic environment is recognized in Soil Taxonomy. Higher categories of the system use differentiating characteristics such as broad moisture and temperature regimes as well as the presence or absence of diagnostic horizons and soil properties. Within these broad categories, other factors such as parent materials and relief give rise to differences among individual soils. It is these differentiating factors which give rise to unique characteristics of the various classes of soils in the lower categories of the soil classification system and, in turn, affect the adaptability and vigor of plants. Variations in climate caused by such factors as altitude, prevailing winds, and seasonality are reflected in the distribution of specific plant species within broad vegetative patterns. The discrimination of plants for an optimum growing environment defined in terms of soils and climate make feasible the delineation of resource units suitable for agricultural planning.

among soil climate, and plant growth. Soil resources are often held according to the U.S. Department of Agriculture's Soil Taxonomy. Agricultural characteristics are classified according to the U.S. Department of Agriculture's "Crop Climate Taxonomy." The basic principle of each taxonomy are discussed as a guide to discussing the derivation of the production potential areas and resource planning units.

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The interrelated nature of soil and climate in the physiographic and biologic environment is recognized in soil taxonomy. Higher categories of the system are differentiating characteristics such as broad moisture and temperature regimes as well as the presence or absence of diagnostic horizons and soil properties. Within these broad categories, other factors such as parent materials and relief give rise to these differentiating factors which give

characteristics of the various classes of soils in the lower categories on system and, in turn, affect the adaptability and vigor of climate caused by such factors as altitude, prevailing winds, etc. in the distribution of specific plant species within the limits of plants for an optimum growing

Soil Taxonomy

Soil Taxonomy^{1/} is a soil classification system developed by scientists from the U.S. Department of Agriculture, from land grant universities in the United States and from many foreign countries.

The system, based on 50 years of soil research and published in 1975, is new in design and nomenclature above the categorical level of the soil series. Nomenclature in prior systems was characterized by ambiguous common names, diverse linguistic origins, and few systematic properties. Nomenclature in Soil Taxonomy uses mainly classic Greek and Latin roots that are connotative as far as possible and fit most European languages without translation. Moreover, the roots are combined in a systematic manner so that the name of each taxon clearly indicates the place of the taxon in the system and connotes some of its important properties. Soil scientists using Soil Taxonomy can now make certain statements about soil properties from direct reference to the soil name.

The classification system is based upon natural relationships and is designed to emphasize relationships which enhance predictions that pedologists can make about the behavior of a particular taxon under stated conditions for stated purposes. The definitions of the diagnostic criteria are intended to be factual and leave little or no option for subjective application. Each category is an aggregate of taxa, defined at the same level of abstraction. The categories are order, suborder, great group, subgroup, family, and series, expressed in order of decreasing rank. The highest category, order, has the smallest number of classes and the greatest degree of generalization and heterogeneity progressing to the lowest category, the series, which divides soils into a large number of classes that are quite homogeneous and based on criteria similar to those used for classes in other categories; however,

^{1/}Soil Taxonomy, A Basic System for Soil Classification for Making and Interpreting Soil Surveys. Soil Conservation Service, USDA. Ag. Handbook No. 436, December, 1975.

the range in one or more properties is much narrower than that permitted in higher categories.

Properties:

Conceptually, the system, at the order level, groups soils into ten classes on the basis of the presence or absence of diagnostic layers (horizons) and unique chemical, physical, or mineralogical properties. Within these orders, only the nature and properties of the specific soils in those orders need to be considered in applying differentiating characteristics to divide orders into suborders, great groups, etc. Hence, differentiating characteristics are not applied uniformly throughout the system but are selected, as appropriate, to produce the desired taxa to categorize the diverse and complex population into successively more homogeneous taxa. Generally, suborder differentiation tends to emphasize moisture and temperature regimes. Great group differentiations are based on kinds and arrangements of diagnostic horizons and different genesis. Subgroups are based on properties common to other categories or are not used for any taxon at a higher level in the system.

Families are the lowest class of the systematic portion of Soil Taxonomy. Soil families are differentiated by a number of soil properties. The most common are particle size distribution in the horizons of major biologic activity below plow depth, mineralogy of the same horizon, and soil temperature regime. Other properties such as soil depth, content of carbonates, cementation, and the like are also employed if important. In countries where soil series are not uniformly used, phases of soil families may be used as soil mapping units and represent the most completely defined classes in the taxonomy.

Nomenclature:

Name roots used in Soil Taxonomy are mainly from Greek and Latin words with connotative meaning.

Table 1. -- Derivation of soil order names.

NAME	Formative Element		Major Characteristics of Order
	Element	Meaning	
Entisol	ent	meaningless symbol	Recently formed soils.
Vertisols	vert	L. <u>verto</u> , turn	Shrinking and swelling clay (30%) soils.
Inceptisol	cept	L. <u>inceptum</u> , beginning	Young soils with few or faint diagnostic features or layers.
Aridisol	arid	L. <u>aridus</u> , dry	Soils of arid regions.
Mollisol	oll	L. <u>mollis</u> , soft	Soils of steppes and plains with thick dark surfaces high in humus.
Spodosol	od	Gr. <u>spodos</u> , wood ash	Soils with subsoil accumulations of sesquioxide and humus.
Alfisol	alf	meaningless symbol	High base status soils; subsurface layer of accumulation of translocated clays.
Ultisol	ult	L. <u>ultimus</u> , last	Low base status forest soils; subsurface layer of accumulation of translocated clays.
Oxisol	ox	Fr. <u>oxide</u> , oxide	Sesquioxide-rich, highly weathered soils of the intertropical regions.

The formative elements in the soil name are carried through to the subgroup level so that the name will connote certain soil properties and indicate each higher taxon to which it belongs, the soil subgroup Typic Humitropept is used to demonstrate the system as follows:

ORDER	INC	EPT	ISOL
SUBORDER		TROP	EPT
GREAT GROUP	HUMI	TROP	EPT
SUBGROUP	TYPIC	HUMI	TROP EPT

Family names are formed by adding specific descriptive elements as modifiers to the subgroup name. An example of a family name would be:

Typic Humitropept, fine, mixed, isothermic.

Crop Climate Taxonomy

Patterns of natural vegetation, have been created by the same temperature and moisture regimes and are associated with the broad patterns of soils used in Soil Taxonomy. These patterns can be differentiated into more detailed taxa on the basis of factors known to be important to specific plants within the broad vegetative patterns. Such taxa narrow the range of plant adaptability necessary for interpretations relative to adaptability and productivity of plants of economic importance.

The "Crop Climate Taxonomy" is a system that draws upon the vast body of work in climatic/vegetative classification systems and is generalized to accommodate inputs from available sources useful for classification. The system is designed to capture the major factors which influence plant life -- temperature, moisture, and light. The specific parametric indicators of these factors are selected and defined in terms of those most commonly available from standard weather records. Hence, the taxa can be defined in terms of readily available data and calibrated to field observations of existing vegetation. By establishing and measuring the ecological tolerance of a great many plants the system can also be used to specify crop climate delineations through consideration of the existing vegetation in areas which have no weather stations.

Three levels of classification are conceptualized in the taxonomy -- primary, secondary, and tertiary. Primary level taxa are based upon day length, annual precipitation, and seasonality of precipitation. Latitude is used as an indicator of day length and the general temperature regime with provisions for altitudinal variation and its effect on temperature. Primary categories are divided into

adding specific descriptive elements as modifiers

of which some would be:

deep, thin, mixed, shallow, etc.

Crop Climate Taxonomy

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incorporated in only - category

of taxa are based upon broad (general) criteria

division. Latitude is used as an indicator of

the regime with provisions for altitudinal

taxa. Primary categories are divided into

secondary categories using monthly precipitation during the wet season, average monthly temperature during the wet season expressed in 2°C gradients, and the occurrence of frost. Tertiary levels have not yet been developed. Anticipated criteria for this level include temperature extremes, continentality, and climate equability.

Primary Crop Climate Zones:

Primary crop climate zones are classified in terms of day length, annual precipitation, and seasonality of precipitation. The system theoretically encompasses 108 primary taxa; however, in actuality some may not actually exist (4000 mm of moisture in polar climates, for example) and others have no explicit relevance to commercial agriculture. It is estimated that approximately 50 or 60 will be found as important for rainfed agriculture.

Latitude, as a measure of day length and as an approximation of temperature is used to stratify the earth into four zones -- tropic, subtropic, temperate, and polar. The specific criteria for these zones are shown (Table 2).

Table 2. -- Latitude and temperature criteria for crop climate zones.

Zone	Latitude	Average Annual Temperature at Sea Level °C
Tropic	0-24°	> 24
Subtropic	24-34°	18-24
Temperate	34-58°	6-18
Polar	> 58°	< 6

Annual precipitation categories were chosen on the basis of critical levels of precipitation for rainfed agriculture. The nine categories of annual precipitation, starting with one of greater than 4000 mm and ending with a class of less than 300 mm are not of equal width. Category widths at the lower annual precipitation levels are narrower to reflect conditions where minimal absolute changes in

precipitation would be expected to drastically alter plant adaptability and productivity.

The four categories of temperature - latitude (Table 2) are combined with the nine categories of annual precipitation to form the 36 root names for the crop-climate zones (Table 3).

Table 3. -- Annual precipitation ranges and root names for primary crop-climate zones.

Annual Precipitation Ranges	Latitude Temperature Zones			
	Tropic	Subtropic	Temperate	Polar
--mm--	-----Root Names-----			
> 4000	Mad	Hydr	Dev	Siccstir
2500-4000	Pluv	Brum	Not	Pager
2000-2500	Balne	Fluv	Niv	Malk
1500-2000	Plad	Ferac	Hiem	Sbest
1000-1500	Vir	Ror	Hibern	Psychr
750-1000	Cal	Gel	Velp	Astag
500 - 750	Psak	Chondr	Gran	Briz
300 - 500	Siccane	Aestiv	Dan	Alg
< 300	Hid	Pulver	Auchm	Abysstir

The average annual precipitation values, selected to form the ranges which define crop climate taxa, were determined by referencing known critical moisture limits (both minimum and maximum) of important crops in the tropic and subtropic zones of the developing world. Below are listed some of the relevant rainfed requirements of important crops for each value selected.

300 mm

This is considered to be the dividing line between areas suited only to very drought-tolerant forage plants such as saltbush or mesquite and areas able to sustain some level of cultivated crops. Areas which receive more than 300 mm/yr precipitation are usually able to support some small grains (barley or pearl millet, e.g.), sorghum, or drought-tolerant forage legumes such as Bellamon lucerne.

500 mm

This is considered the effective lower limit for rainfed cotton as well as for certain pasture and fodder species such as Rhodes grass and weeping lovegrass. It is taken to be the upper limit for the most drought-tolerant forage legumes such as Bellamon lucerne.

750 mm

This is considered the upper limit for other drought-tolerant pasture and fodder species such as Columbus grass. Above this value climates may be compatible with cassava and Townsville lucerne. Rice requires approximately this minimum amount during the growing season, so unimodal climates this wet or wetter may support it.

1000 mm

This value is usually considered the lower limit for the optimal cultivation of many pasture and fodder species, such as: Molasses grass, pangola grass, guinea grass, dallis grass, and Napier grass. It is also considered the lower limit for rainfed pineapple, sisal, and citrus, and the optimal range for cassava. Maize usually does well with about this much rainfall during its growing season, so unimodal climates this wet or wetter may support it.

1500 mm

This is taken to be near the upper limit for optimal performance of soybean, cotton, pineapple, and such legume fodder/forage crops as kudzu. It is considered the lower limit for some other crops such as banana, coconut, coffee, and possibly cacao.

2000 mm

This is considered the lower limit for oil palm, and for the optimal performance of rainfed banana. It may be the upper limit of optimal performance for coffee.

2500 mm

This is considered the lower limit for tea, rubber, and black pepper, and the upper limit for cacao, mango, and some important leguminous fodder crops such as Townsville lucerne.

4000 mm

This is taken to be the upper limit for rubber and rice. At this level of rainfall few crops, with the possible exception of black pepper, are well documented.

The values defining the Crop Climate taxa by latitude and temperature were selected with latitude as a proxy for daylength, and with temperature varying both with latitude and altitude. Latitude serves as a rough indication of climatic

equability, length of growing season, occurrence of frost, and even precipitation, to varying degrees of reliability. It is known that plants have daylength and temperature, as well as rainfall requirements, but most often their reported temperature requirements are phrased in units other than mean annual or monthly temperature. For the purposes of the "Crop Climate Taxonomy," taxa are delimited in accordance with certain past climatological practice and modified by judgemental considerations about known cropping patterns and isotherm maps. Temperature values expected of latitudinal zones are defined and provisions are made for altitudinal variation to be reflected in the nomenclature. Certain values of average annual temperature may be taken to imply the occurrence of yearly frosts. Such frosts are thought to have determinant importance for vegetation.

The basic 36 root names are expanded to 108 by adding suffixes "id", "(i)ous", and "(i)al" to the root names to indicate the number of wet seasons. The criteria for these suffixes are shown (Table 4).

Table 4. -- Number of wet seasons and corresponding suffix designations for primary crop climate zones.

Number of Wet Seasons	Criteria	Suffix Designator
0	No clearly defined groupings of months with average monthly precipitation significantly greater than monthly average annual precipitation.	id
1	A single group of two or more months with average monthly precipitation significantly greater than monthly average annual precipitation.	(i)ous
2	Two groups of two or more months with average monthly precipitation significantly greater than monthly average annual precipitation.	(i)al

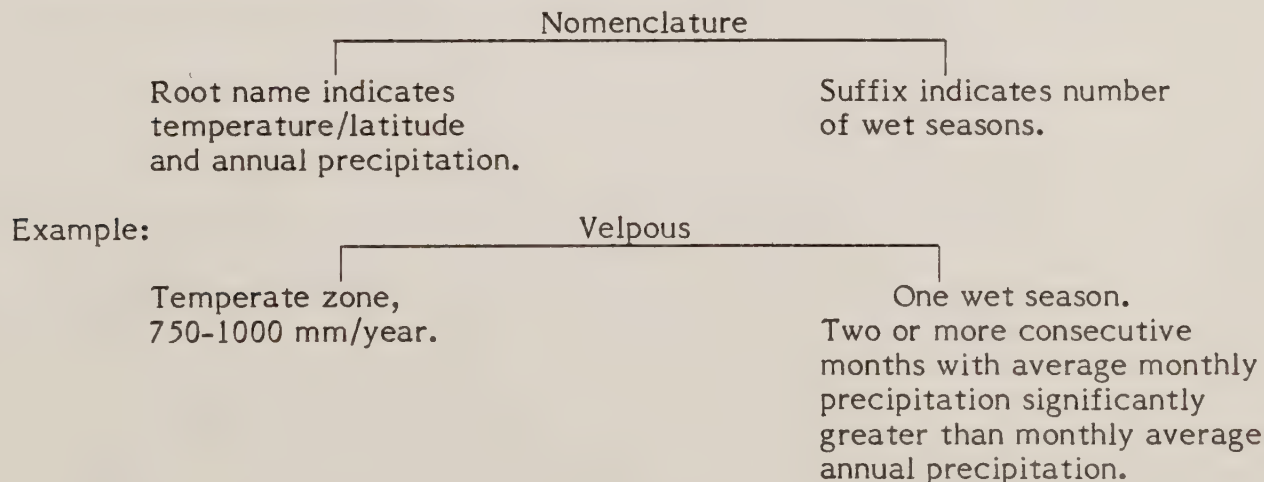
As an example, the name root for a crop climate zone in the Temperate latitude-climate category with 750-1000 mm of annual precipitation is Velp. The three possible primaries are then:

- (1) Velpid
- (2) Velpous
- (3) Velpial

A Velpid crop climate zone is one that is located between the 34th and 58th latitude, with a mean annual temperature in the 6-18°C range mean annual rainfall of 750-1000 mm, and with no apparent seasonality of precipitation (no clearly defined groupings of months with average monthly precipitation significantly greater than the monthly average annual precipitation). Velpous would be in the same latitude and mean annual temperature and precipitation ranges, but would have one pronounced precipitation period with average monthly precipitation greater than monthly average annual precipitation. In a similar manner, Velpial would demonstrate similar location precipitation, and temperature ranges, but have two pronounced precipitation periods.

A schematic of the primary crop climate name is shown below (Figure 1).

Figure 1. -- Primary crop climate taxonomy.



As an example, the same root for a crop climate zone in the Tropics. In the climate category with 750-1000 mm of annual precipitation is Velid. In three possible climates are shown:

(1) Velid

Velid crop climate zone is one that is in area between the 25th and 30th latitude with a mean annual temperature in the range of 25-30°C and annual precipitation of 750-1000 mm. In the climate category with 750-1000 mm of annual precipitation (no clearly defined groupings or months with average precipitation greater than the monthly average annual precipitation) latitude and mean annual temperature are in the same range, but would have a pronounced precipitation period with average monthly precipitation greater than monthly average annual precipitation. In a similar manner, Velid would demonstrate similar location precipitation and temperature ranges, but have two pronounced precipitation periods.

A schematic of the primary crop climate zone is shown below (Figure 1).

Figure 1 -- Primary crop climate taxonomy.

Numbering

Shifts in the number of the zone.

Root name indicates temperature, latitude and annual precipitation.

Example:

Temperature zone 750-1000 mm/yr

Two or more consecutive months with average monthly precipitation significantly greater than average annual precipitation.

Secondary Crop Climate Zones:

Primary crop climate zones are divided into secondary crop climate zones on the basis of the occurrence of frost, the average monthly temperature during the wet season(s), and precipitation characteristics during the wet season(s).

Nomenclature for secondary crop climate zone consists of three words: the first two words reflect the criteria used to identify the secondary taxa; the third word identifies the primary taxa (the formation of which was discussed in the prior section).

The first word in the secondary crop climate nomenclature indicates the presence or absence of frost:

occurrence of frost -- "cryic"

absence of frost -- "thermic"

The second word in the secondary crop climate nomenclature indicates the mean monthly temperature during the wet season(s) and the quantity of rainfall in the wet season(s).

The mean monthly temperature during the wet season(s) is expressed in 2°C gradients and the corresponding name for each of these increments forms the prefix of the second word (Table 5).

Table 5. — Mean monthly temperature gradients and prefix indicators for secondary crop climate zone name.

Mean Monthly Temperature °C	Prefix Indicator
< 0	Nul
0 - 2	Bi
2 - 4	Qua
4 - 6	Hex
6 - 8	Oct
8 - 10	Dec
10 - 12	Nai
12 - 14	Arb
14 - 16	Sit
16 - 18	Teman
18 - 20	Ash
20 - 22	Di
22 - 24	Cator
24 - 26	Seis
26 - 28	Huit
28 - 30	Dix
> 30	Cent

Precipitation levels during the wet season determine the suffix portion of the second word of the secondary designator. As previously discussed, one of the three primary class classifiers was the number of wet seasons --- no pronounced wet season, one wet season, and two wet seasons. The suffix name is keyed to mean annual rainfall level, the number of wet seasons, and level(s) of precipitation in the wet season(s) (Table 6).

Table 6. -- Average Monthly Precipitation Levels in the Wet Season(s) by Average Annual Precipitation (AAP) and Suffix Names
Suffix describing Average Monthly Precipitation (AMP) of the Climate during its Wet Season(s)

AAP (mm)	eukrene			parakaster			telmatos			apobammkin			brechina			ardeutos		
	# Wet Seasons	Intensity (Amount/mm)	# Wet Seasons	Intensity (Amount/mm)	# Wet Seasons	Intensity (Amount/mm)	# Wet Seasons	Intensity (Amount/mm)	# Wet Seasons	Intensity (Amount/mm)	# Wet Seasons	Intensity (Amount/mm)	# Wet Seasons	Intensity (Amount/mm)	# Wet Seasons	Intensity (Amount/mm)	# Wet Seasons	Intensity (Amount/mm)
> 4000	0	Null (> 330)	1	Mild (< 400)	1	Hyper (> 400)	2	Both mild (< 400)	2	Both mild (< 400)	2	1 mild (< 400) 1 hyper (> 400)	2	Both hyper (> 400)	2	Both hyper (> 400)	2	Both hyper (> 400)
2500 - 4000	0	Null (210-330)	1	Mild (< 350)	1	Hyper (> 350)	2	Both mild (< 350)	2	Both mild (< 350)	2	1 mild (< 350) 1 hyper (> 350)	2	Both hyper (> 350)	2	Both hyper (> 350)	2	Both hyper (> 350)
2000 - 2500	0	Null (170-210)	1	Mild (< 300)	1	Hyper (> 300)	2	Both mild (< 300)	2	Both mild (< 300)	2	1 mild (< 300) 1 hyper (> 300)	2	Both hyper (> 300)	2	Both hyper (> 300)	2	Both hyper (> 300)
1500 - 2000	0	Null (130-170)	1	Mild (< 250)	1	Hyper (> 250)	2	Both mild (< 250)	2	Both mild (< 250)	2	1 mild (< 250) 1 hyper (> 250)	2	Both hyper (> 250)	2	Both hyper (> 250)	2	Both hyper (> 250)
1000 - 1500	0	Null (90-130)	1	Mild (< 180)	1	Hyper (> 180)	2	Both mild (< 180)	2	Both mild (< 180)	2	1 mild (< 180) 1 hyper (> 180)	2	Both hyper (> 180)	2	Both hyper (> 180)	2	Both hyper (> 180)
750 - 1000	0	Null (62-90)	1	Mild (< 125)	1	Hyper (> 125)	2	Both mild (< 125)	2	Both mild (< 125)	2	1 mild (< 125) 1 hyper (> 125)	2	Both hyper (> 125)	2	Both hyper (> 125)	2	Both hyper (> 125)
500 - 750	0	Null (42-62)	1	Mild (< 90)	1	Hyper (> 90)	2	Both mild (< 90)	2	Both mild (< 90)	2	1 mild (< 90) 1 hyper (> 90)	2	Both hyper (> 90)	2	Both hyper (> 90)	2	Both hyper (> 90)
300 - 500	0	Null (25-42)	1	Mild (< 60)	1	Hyper (> 60)	2	Both mild (< 60)	2	Both mild (< 60)	2	1 mild (< 60) 1 hyper (> 60)	2	Both hyper (> 60)	2	Both hyper (> 60)	2	Both hyper (> 60)
< 300	0	Null (< 25)	1	Mild (< 38)	1	Hyper (> 38)	2	Both mild (< 38)	2	Both mild (< 38)	2	1 mild (< 38) 1 hyper (> 38)	2	Both hyper (> 38)	2	Both hyper (> 38)	2	Both hyper (> 38)

Considering the prior examples of the primary class names, there were three possibilities: Velpid, Velpous, and Velpial. The prefix indicates a zone of 750 mm to 1000 mm range in annual precipitation and a 6°C to 18°C mean annual temperature range. The suffixes, "id," "(i)ous," and "ial" indicate no wet season, one wet season, and two wet seasons, respectively. Based on these three primary class names, if it is assumed that frost could occur and the mean monthly temperature is 11°C, the following secondary crop climate names are possible:

	<u>Frost</u>	<u>Average Monthly Wet Season Temperature</u>	<u>Average Monthly Wet Season Precipitation</u>	<u>Primary Name</u>
No wet season	crylic	nai	eukrene	Velpid
One wet season	crylic	nai	parakaster	Velpous
	crylic	nai	telematos	Velpous
Two wet season	crylic	nai	apobammkin	Velpial
	crylic	nai	brechina	Velpial
	crylic	nai	ardeutos	Velpial

If frost did not occur, there would exist the same set of possibilities with the first word of the secondary designator of the secondary crop climate names being "thermic". In the 6 to 18°C mean annual temperature range, the prefix for the second word could also be "oct", "dec", "arb", "sit", or "teman" based on the calculated mean monthly temperatures during the wet season(s).

Naming of the secondary crop climate zones is shown below (Figure 2).

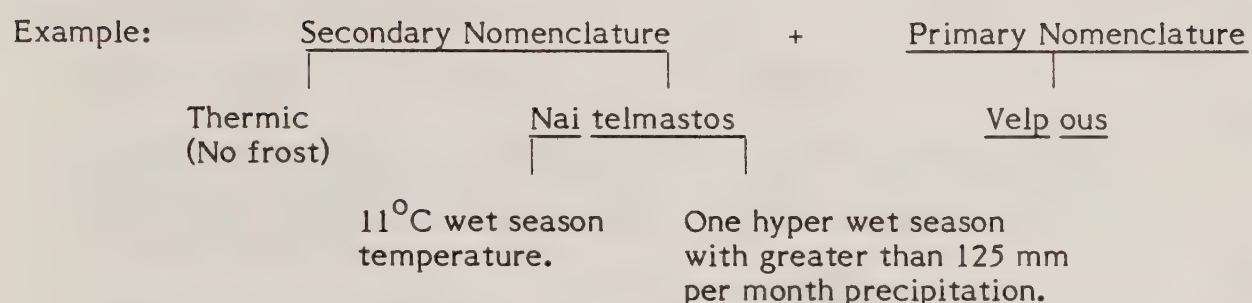
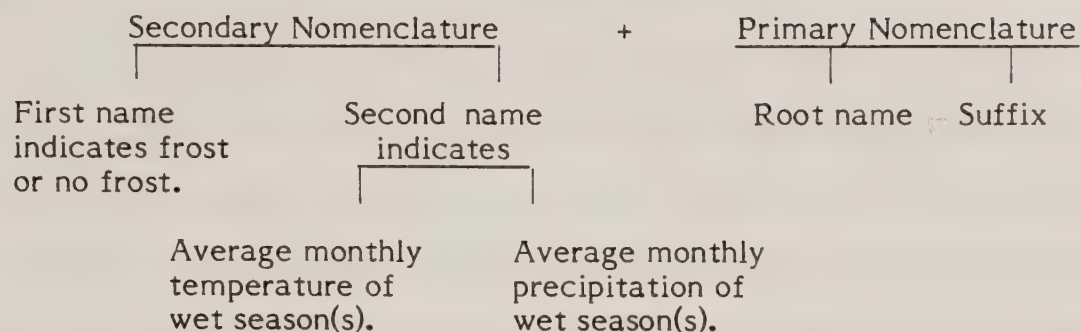
Naming of the secondary crop climate zones is shown below (Figure 2).
 calculated mean monthly temperatures during the
 second word could also be "oct", "dec", "sep", "jul", "jun", "may", "apr", "mar", "feb", "jan", "dec", "nov", "oct", "sep", "aug", "jul", "jun", "may", "apr", "mar", "feb", "jan".
 "therm". In the 6 to 12°C mean annual temperature range, the prefix for the
 first word of the secondary designation is the same as the climate names for the
 If frost did not occur, but would occur the next year, possibilities with the

Prefix	Secondary designation	Primary designation	Mean annual temperature (°C)
Two wet season	crvic	crvic	12 to 18
One wet season	crvic	crvic	18 to 24
No wet season	crvic	crvic	24 to 30

in temperature is 11°C. The following
 class 5 wet, it is assumed that in
 one wet season, and two wet seasons, respectively, based on three three in
 the temperature range. The suffixes "ct", "st", and "dec" indicate
 to 1000 mm range of annual precipitation and a 6°C to 12°C mean annual
 possibilities: Vapic, Vapicst, and Vapicdec. The secondary designation is 12 to 18°C
 Considering the data examples of the primary class 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Figure 2. -- Secondary crop climate taxonomy.

Secondary Crop
Climate Zone
Name:



Map unit notation for Costa Rica expresses associations or gradations of climate. (\emptyset /Fluvi-) Balneous, for example, is to be read, "Balneous mixed with or grading to Fluvi-Balneous," the null sign (\emptyset) indicating that no prefix relating to altitudinal cooling (such as Fluvi) is necessary for part of the map unit.

The Resource Planning Unit and Production Potential Area Concepts

The concepts and definitions of Resource Planning Units (RPU) and Production Potential Areas (PPAs) reflect the relationships among soils, climate, and plant growth. The natural landscape may be viewed as an intricate complex of similar and dissimilar climate, soils, and vegetation which occur in a consistent, regular, and/or repeating pattern. The delineation of the landscape into these natural physiographic and ecological map units furnishes the geographically-identifiable needs of the Agricultural Resource Information System as RPUs. RPUs are generally composed of a variety of similar and often contrasting soil bodies and microclimates which may occur in intricate and complex spatial

patterns. Such complexities, however, are generally regular and repeating in nature and are uniquely different from the spatial patterns and complexities of other RPUs.

RPUs have discernible natural features and properties that distinguish them from other RPUs. The interpretation of RPUs for plant adaptability, productivity, and management requirements must take into account the soils and microclimates in greater detail. Hence, the individual, major soil bodies and associated microclimates composing an RPU become the analytical units, production potential areas, for production potential analysis.

RPUs and PPAs are specifically defined as follows:

Resource Planning Unit -- a geographically-delineated unit of land (not necessarily contiguous), that is relatively uniform with respect to land forms, kinds and patterns of soil bodies, climates, water resources, and potential vegetation.

Production Potential Area -- a PPA is an aggregate area of individual soil bodies and associated micro-climates within an RPU which is sufficiently homogeneous with respect to plant adaptability, potential management requirements, and productivity to be reliably depicted by unique estimates of those parameters for national and regional analysis and planning.

RPUs serve several purposes. They divide the landscape into natural, physiographic planning and implementation units. RPUs serve as reference points for field technicians. They can be described with respect to their climates, physical characteristics, and major soil components to provide planners with a device to screen development options. They provide the geographic reference for the Land Inventory Subsystem of the Agricultural Resource Information System to merge, cross-classify, and aggregate natural resource data from various sources with tabular data by administrative boundaries.

Although PPAs have not yet been identified for the RPUs in Costa Rica, they are taxonomically definable and could be mapped in more detailed studies; however, mapping them is unnecessary for national planning and policy analysis. Policy choices and priorities can be based upon estimates of the area, distribution,

and patterns of PPAs within an RPU. Detailed investigation and mapping can be more efficiently programmed after national policies and priorities are established.

Identification of PPAs in the future would afford a basis for making interpretations of crop adaptability, productivity, and management requirements for the analyses of planning and management options. The distribution, size, and associations of the individual PPAs and their patterns with respect to other PPAs within an RPU would need to be known. Program implementation is affected by the nature of the individual resources and by the interrelationships, patterns, and size of the resource units. The kinds and intensities of feasible programs would be included in the description and interpretation of RPUs to aid planners in screening potential management options for PPAs.

Patterns of distribution of PPAs can be defined. The three PPA patterns used in the agricultural resource information systems of other countries, and ultimately would be useful in describing PPAs and the planning and management constraints they impose for Costa Rica, are defined as follows:

Intricately Patterned PPAs -- When two or more PPAs generally occur in patterns composed mostly of individual PPA bodies of less than five hectares, they will be described as intricately patterned. For national planning, such PPAs are considered as a single unit and represented by a single-valued input coefficient (productive factors) and an output (yield) coefficient.

Finely Patterned -- When two or more PPAs generally occur in patterns composed of individual PPA bodies usually larger than five hectares they will be described as finely patterned. For national planning, finely patterned PPAs are considered as individual units for most management options but carry size constraints for some program and project purposes.

Coarsely Patterned -- When individual PPA bodies occur within an RPU in coarse patterns that are predominantly larger than 100 hectares, they are described as coarsely patterned. Such PPAs are treated as separate units for national planning.

Consider the following example: An RPU consists of a mountain range intersected by small valleys. Two PPAs, representing the flood plains and terraces, within the RPU are described as coarsely patterned in the valleys. Two intricately

patterned PPAs, one with deep, fertile soils and the other with shallow, rocky, infertile soils, form the mountain portion of the RPU. Because the valley PPAs are coarsely patterned, different programs for the management and utilization of the two PPAs can be considered and both can be planned independent of the mountain PPAs. The two mountain PPAs, however, must be planned as a single unit because they are intricately patterned. Hence, expected crop output for planning purposes would be a single-valued estimate reflecting uniform management (and like inputs applications) of the two mountain PPAs.

Methods and Materials for Classification

Soils

In order to work with the concepts of the RPU's and PPAs, a knowledge of the kind and distribution of soils is essential. This knowledge commonly is derived in several ways. It can most easily be acquired from published maps and reports dealing directly with the subject. These may range from very detailed studies in which soils are mapped and described with precision suitable for site management to those highly generalized for regional planning procedures. This knowledge can also be derived from published and unpublished data dealing with subjects related to soils and soil genesis, e.g., geology, vegetation, climate, etc., supplemented by exploratory field studies.

Published information about the kinds and distribution of soils in Costa Rica is found mainly in generalized studies dealing with large sections of the country. Additional published information is in more detailed studies of relatively inextensive areas, such as irrigation and drainage project areas. Other information is in unpublished notes, reports, and student theses.

Efforts of the CRIES project to assemble a soil map of Costa Rica were coordinated and joined with the efforts of the Natural Resource Division of the Office of Agricultural Sector Planning (OPSA). Collaboration of Samuel Perez (OPSA), Alfredo Alvarado (University of Costa Rica), and Ellis Knox (consultant to the CRIES project and formerly at the Turrialba Center) was valuable for assembly and evaluation of published material, introduction of unpublished information, and reclassification of the soils.

In the previously published works, several systems of classifying soils had been used. By using descriptive materials that were available, the soils were reclassified in terms of a common system, Soil Taxonomy. For those areas for which no pedological classification was available, classification was inferred from available

data on geology, climate, vegetation, topography, and geologic age. The inferred classification was based on more specific data. Data were sufficiently meager that the classifications derived can, in some instances, be considered tentative pending completion of additional and more comprehensive studies.

The soil map was compiled by OPSA on the nine topographic sheets at 1:200,000 scale of the Costa Rican National Geographic Institute. The map, dated March, 1978, has mapping units, mostly associations, based on soil subgroups even though it bears the title, "Asociaciones de Grandes Grupos de Suelos de Costa Rica." The map, as issued by OPSA, has a legend sheet which lists principal and associated subgroups and a few major soil characteristics. Tabular descriptions, prepared by the CRIES project, describe the proportions of the component subgroups, land form, parent material, underlying material, climatic factors and, for each component, slope, drainage, depth, texture, rock fragments, water holding capacity, permeability, flooding and ponding, reaction, base saturation, and limitations for agricultural use (Appendix A).

Crop Climate

Climatological data were used in various ways. Annual temperature was calculated by subtracting an altitudinal correction from latitudinal temperatures. The altitudinal correction was determined by the formula

$$\frac{\text{altitude}}{305 \text{ m}} \times 1.8^{\circ}\text{C}.$$

Here, "altitude" means the average of a range of altitudes displayed on topographic maps for the PPA.

Monthly average temperature and precipitation were the keys to classifying meteorological stations according to the "Crop Climate Taxonomy." Number of wet seasons, average annual temperature, latitude, and total average annual precipitations were used to classify the weather stations at the Primary level of the "Crop Climate Taxonomy." The monthly average precipitation was evaluated

to determine the intensity of any wet season. Generally a wet season was recognized as the period during which most of the annual precipitation falls. Generally, too, abrupt increases in the monthly average precipitation were easy to note and to use to define wet seasons. Classification of the stations at the secondary level is achieved with the aid of the simple formula:

$$P_m = \frac{P_1 + P_2 \dots P_n}{n},$$

where P_m is the average monthly precipitation during the wet season, P_n is the average precipitation for the n -th month, and n the total number of months taken to be in the wet season. Temperature classification at the secondary level was completed for the 71 stations for which monthly temperature data were available by applying the formula:

$$T_w = \frac{T_1 + T_2 \dots T_n}{n},$$

where T_w is the average monthly temperature during the wet season, T_n is the average temperature for then n -th month, and n the total number of months taken to be in the wet season. Using these values for a given weather station, classification for the secondary level can be completed by adding the temperature prefix to the modifier, and noting the presence or absence of frost (supplying "cryic" or "thermic" to the taxon name).

After all weather stations were classified, they were located at points corresponding to their locations and labelled on maps. Weather stations, once classified, are used to form the nuclei of the crop climate map units. Each map unit is delineated by drawing lines between nuclei made up of one to many stations. The positions of these lines on the map are fixed by a judgemental process. Input to this process includes field examination of terrain for changes in vegetation and cropping practices. Topography is also taken into account. Existing floristic material, especially floristic or Holdridge Life Zone maps, are also used in fixing

these lines. In the present state of the art, correlations between specific plants and specific crop climates can only be inferred; when additional empirical data are available, it should be possible to correlate specific plants with specific crop climate taxa.

At the Primary and Secondary levels of the Crop Climate Taxonomy, each map unit may depict associations of climates occurring in repeating patterns across areas or gradations to other climates. However, the boundaries of the map units do not guarantee that the climate specified for a map unit will never occur outside the map unit. Thus, an area may be said to lie in a map unit "Auchmous" which adjoins a map unit "Danious", but small areas of "Danious" climate may be found in the region designated "Auchmous" and vice versa.

RPU's and PPAs

As previously discussed, Resource Planning Units (RPUs) and Production Potential Areas (PPAs) are broad segments of landscape in which climate, soils, and vegetation occur in a consistent, regular and/or repeating pattern. The former are sufficiently extensive that they can be shown on maps of intermediate or small scale; the latter comprise segments of the mappable area, and although they are too small to be shown conveniently on maps suitable for national planning, they could be depicted cartographically on maps of larger scale.

At the present state of the art, the creation of RPUs and PPAs is largely a matter of judgement. Knowledge about the kinds of soils, climate, and natural vegetation and their distribution, as portrayed in the soil and crop-climate studies, are combined to create broad segments of the national or regional landscape that are relatively uniform with respect to the physical environment within which a specific kind or kinds of agricultural endeavor can be carried out with expected results.

The actual process of creating RPUs involves superimposing transparent copies of the soil and crop climate maps over the topographic maps, which are used as reference maps. Areas uniform with respect to both climate and soil patterns can then be outlined. In some situations, PPAs could be identified on the basis of physical characteristics but the potential for agricultural use might not be significantly different; or a single overriding factor may dictate the potential, or lack of it, for economic use. In these examples, an RPU would be identified but they would not be divided into PPAs. As an illustration, the most simple RPU is one in which a single kind of soil on uniformly sloping topography occurs in a single climatic region, e.g., a hypothetical area of wet loamy soils (Typic Tropaquepts) on nearly level (slopes 0-2 percent) plains in a tropic climatic region having 2500 to 4000 mm annual precipitation which is uniformly distributed throughout the year; average annual temperature is higher than 24°C (the climate is Eukrene Pluvial).

In contrast, RPUs that consist of more than one kind of soil and/or topographic situation in combination with climatic regimes which differ over short distances or with changes in altitude, aspect, and/or latitude represent situations which commonly occur. If the complexly patterned physical environment in a region is sufficiently extensive, then PPAs may be more suitable for national planning. Commonly, the subdivision of a complex area into a series of less complex environments could provide detail considered more appropriate for project planning than for national planning.

PPAs are recognizable from the source materials used in developing the basic soil and crop-climate studies. They are significant components of an RPU but at the level of generalization required for the Land Resource Base Report, it is not feasible to show them cartographically.

The criteria for establishing PPAs are perhaps best described by example. Consider a geographic area consisting of steeply sloping limestone ridges with

shallow stony soils separated by level or nearly level ground with deep non-stony soils; the two kinds of landscape are of nearly equal extent. For purposes of this illustration, climate is uniform throughout the area. Neither landscape is individually sufficiently extensive to be considered an RPU, so the two landscapes are considered together for planning purposes. The steep ridges comprise one PPA and the intervening level ground comprises the other PPA; each has unique potential, or lack of it, for agricultural use.

A corresponding illustration is one in which the soil component remains constant and climate differs. Consider a mountainous area with steep slopes and predominantly shallow soils extending to elevations of several thousand meters, temperatures vary significantly with changes in altitude. In this instance, potential for economic use differs at low, mid, and upper ranges of elevation. Each range of elevation can be identified as a PPA within the mountain RPU.

The proportion of an RPU that is represented by a PPA is estimated on the basis of the resource scientists' accumulated knowledge about the RPU. In some instances the figure can be based on field observations, in other cases by use of reference maps, and in yet other situations by use of judgement and previous experience. Rarely would precise measurement of the extent of PPAs be feasible.

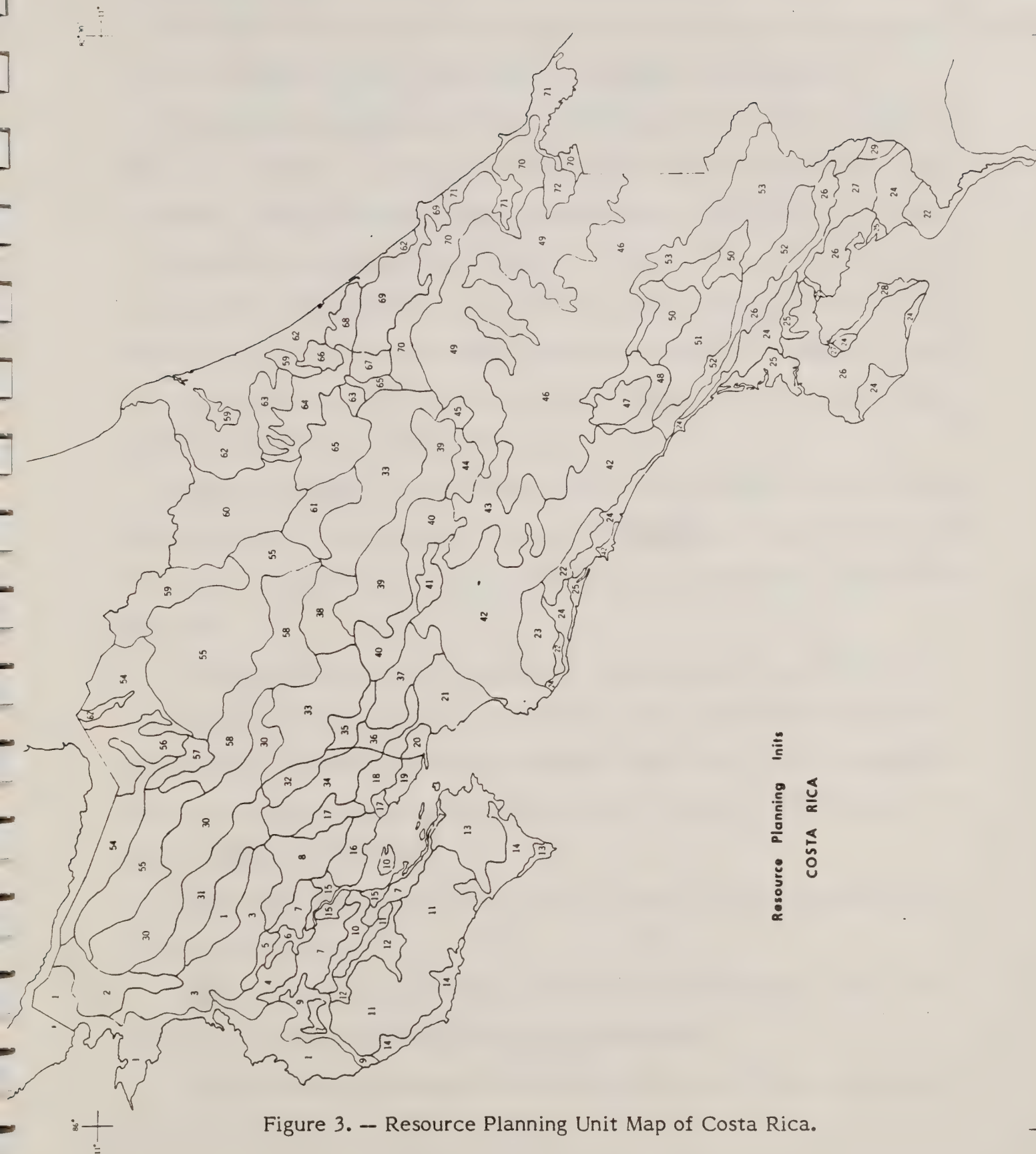


Figure 3. — Resource Planning Unit Map of Costa Rica.

RPU Summary Table

The table of RPUs contains the composition of each RPU in terms of kinds of soil and crop climate zones. Each column in the table is described below.

Dominant soil map unit provides the identification of the most extensive soil map unit in the RPU. It is an alpha-numeric symbol used on the March 1978 edition of the map, "Asociaciones de Grandes Grupos de Suelos de Costa Rica," 1:200,000.

Dominant and subdominant soil identifies the one to three principal soils in the soil association comprising the soil map unit; the most extensive soil is listed first. Where two or three soils are of approximately equal extent, the dominant soil is the first one listed by the authors of the soil map. This information is taken from the descriptive sheets for the soil map units.

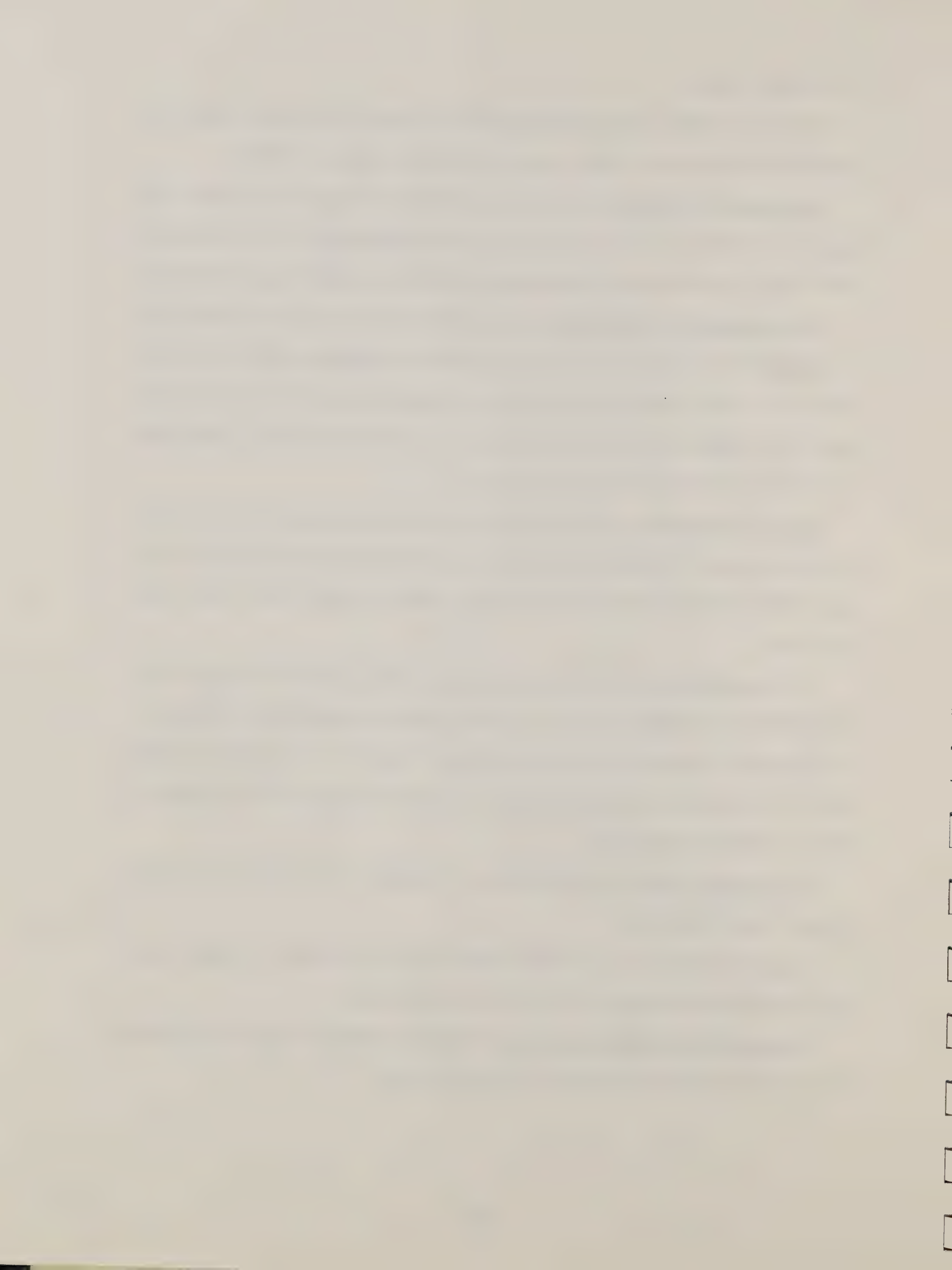
Percent composition is an estimate of the relative proportion of each soil in the soil map unit. These figures are taken from the descriptive sheets for the soil map units; estimates of relative proportions were not provided for a few of the map units.

Other soil map units identifies those soil map units, and the soils therein, that are distributed throughout the area of the RPU. They are significant inclusions but are estimated to make up less than 40 percent of the RPU. These are identified from the soil map by the physical scientists after the location of the boundary of the RPU has been determined.

Crop climate zone is the classification of climate at the primary level of the "Crop Climate Taxonomy."

Zone is one of four zones which stratify the earth according to length of day, as reflected by latitude, and a broad range of temperature.

Average annual precipitation is the numerical average of annual precipitation for the years of record, as taken from climatic record.



Average annual temperature is the arithmetic average of annual temperature for the years of record, as taken from climatic records.

Seasonality indicates the presence or absence of wet season(s) and the period of the year in which the wet season(s) can be expected to occur; this is interpreted from climatic records.

RESOURCE PLANNING UNITS - COSTA RICA

RPU No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil	Subdominant Soil	Percent composition	Other Soil Map Units	Crop Climate Zone	Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
1	I23	Lithic Ustrospepts Lithic Ustorthents Vertic Ustrospepts		30 20 20	I22 Fluventic Ustic Dystrspepts Typic Ustifluvents I21 Fluventic Ustrospepts Fluventic Haplustolls E6 Typic Sulfaquents Tropic Fluvaquents I33 Ustic Dystrspepts Ultic Haplustalfs	Pladous	Tropic	1500- 2000	above 24	one wet season, May through November
2	I33	Ustic Dystrspepts Ultic Haplustalfs		60 20	I23 Lithic Ustrospepts Lithic Ustorthents Vertic Ustrospepts I31 Oxic Dystrspepts Aeric Tropaquepts	Pladous	Tropic	1500- 2000	above 24	one wet season, May through November
3	I18	Typic Ustrospepts Lithic Ustorthents Vertic Ustrospepts		40 20 20	I21 Fluventic Ustrospepts Fluventic Haplustolls I23 Lithic Ustrospepts Lithic Ustorthents Vertic Ustrospepts	Pladous	Tropic	1500- 2000	above 24	one wet season, May through November
4	I21	Fluventic Ustrospepts Fluventic Haplustolls		50 30	M1 Typic Argiustolls Vertic Ustrospepts M2 Fluventic Haplustolls Typic Argiustolls Fluventic Ustrospepts V1 Typic Pellusterts Udic Pellusterts I20 Fluventic Ustrospepts Typic Hstipsamments Fluvaquentic Ustrospepts	Pladous	Tropic	1500- 2000	above 24	one wet season, June through October
5	I29	Fluventic Dystrspepts Vertic Ustrospepts Fluventic Ustrospepts		?		Pladous	Tropic	1500- 2000	above 24	one wet season, May through November

RESOURCE PLANNING UNITS - COSTA RICA

RPU No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil Subdominant Soil	Percent composition	Other Soil Map Units	Crop Climate Zone	Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
6	I1	Typic Tropequepts Tropic Fluvaquents Udic Pellusterts	?	I23 Lithic Ustropepts Lithic Ustorthents Vertic Ustropepts	Pladous	Tropic	1500- 2000	above 24	one wet season, May through November
7	VI	Typic Pellusterts Udic Pellusterts	70 20	I23 Lithic Ustropepts Lithic Ustorthents Vertic Ustropepts I32 Ustic Dystropepts I34 Andic Dystropepts	Pladous	Tropic	1500- 2000	above 24	one wet season, May through November
8	M2	Fluventic Haplustolls Typic Argiustolls Fluventic Ustropepts	?	I23 Lithic Ustropepts Lithic Ustorthents Vertic Ustropepts A1 Typic Haplustalfs	Pladous	Tropic	1500- 2000	above 24	one wet season, May through November
I20		Fluventic Ustropepts Fluvaquentic Ustropepts Typic Ustipsamments	?	M1 Typic Argiustolls Vertic Ustropepts V1 Typic Pellusterts Udic Pellusterts					
9	I21	Fluventic Ustropepts Fluventic Haplustolls	50 30	I23 Lithic Ustropepts Lithic Ustorthents Vertic Ustropepts I29 Fluventic Dystropepts Vertic Dystropepts Fluventic Ustropepts V1 Typic Pellusterts Udic Pellusterts I33 Ustic Dystropepts Ultic Haplustalfs	Pladous	Tropic	1500- 2000	above 24	one wet season, May through November

RESOURCE PLANNING UNITS - COSTA RICA

RTU No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil Subdominant Soil	Percent composition	Other Soil Map Units	Crop Climate Zone	Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
10	I32	Ustic Dystropepts	70	V1 Typic Pellusterts Udic Pellusterts	Pladous	Tropic	1500-2000	above 24	one wet season, May through October
	I33	Ustic Dystropepts Ultic HaplustalFs	60 20						
11	I32	Ustic Dystropepts	70	I33 Ustic Dystropepts Ultic HaplustalFs	Balneous	Tropic	2000-2500	above 24	one wet season, May through November
12	I33	Ustic Dystropepts Ultic HaplustalFs	60 20	I32 Ustic Dystropepts	Balneous	Tropic	2000-2500	above 24	one wet season, May through October
13	E5	Lithic Ustorthents Lithic Ustropepts Lithic HaplustalFs	30 30 20	I33 Ustic Dystropepts Ultic HaplustalFs I23 Lithic Ustropepts Lithic Ustorthents Vertic Ustropepts	Balneous	Tropic	2000-2500	above 24	one wet season, May through November
14	I33	Ustic Dystropepts Ultic HaplustalFs	60 20	I21 Fluventic Ustropepts Fluventic Haplustolls E6 Typic Sulfaquents Tropic Fluvaquents M3 Fluvaquentic Hapludolls Typic Tropaquents Fluvaquentic Haplaquolls	Balneous	Tropic	2000-2500	above 24	one wet season, May through October
15	E6	Typic Sulfaquents Tropic Fluvaquents	40 40		Pladous	Tropic	1500-2000	above 24	one wet season, May through November

RESOURCE PLANNING UNITS - COSTA RICA

RPU No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil Subdominant Soil	Percent composition	Other Soil Map Units	Crop Climate Zone	Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
16	I23	Lithic Ustropepts Lithic Ustorthents Vertic Ustropepts	30 30 20	I19 Typic Ustropepts Typic Haplustalfs Vertic Ustropepts E6 Typic Sulfaquents Tropic Fluvaquents I21 Fluventic Ustropepts Fluventic Haplustolls	Pladous	Tropic	1500-2000	above 24	one wet season, May through November
17	I23	Lithic Ustropepts Lithic Ustorthents Vertic Ustropepts	30 30 20	A1 Typic Haplustalfs Typic Ustropepts Vertic Ustropepts	Balneous	Tropic	2000-2500	above 24	one wet season, May through November
18	I33	Ustic Dystropepts Ultic Haplustalfs	60 20	I21 Fluventic Ustropepts Fluventic Haplustolls I22 Fluventic Ustic Dystropepts Typic Ustifluvents	Balneous	Tropic	2000-2500	above 24	one wet season, May through November
19	I22	Fluventic Ustic Dystropepts Typic Ustifluvents	60 20	E6 Typic Sulfaquents Tropic Fluvaquents I23 Lithic Ustropepts Lithic Ustorthents Vertic Ustropepts	Balneous	Tropic	2000-2500	above 24	one wet season, May through November
20	I22	Fluventic Ustic Dystropepts Typic Ustifluvents	60 20	E6 Typic Sulfaquents Tropic Fluvaquents	Brumi-Pluvius/ (Ø-Fluvi) - Balneous	Tropic to Subtropic	2000-4000	18 and above depending on altitude	one wet season, May through November
21	I33	Ustic Dystropepts Ultic Haplustalfs	60 20	M3 Fluvaquentic Hapludolls Typic Tropaequents Fluvaquentic Haplaquolls E6 Typic Sulfaquents Typic Fluvaquents I24 Aquic Ustropepts	Brumi-Pluvius/ (Ø-Fluvi) - Balneous	Tropic to Subtropic	2000-4000	18 and above depending on altitude	one wet season, May through November

RESOURCE PLANNING UNITS - COSTA RICA

RPU No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil	Percent composition	Other Soil Map Units	Crop Climate Zone	Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
22	U4	Typic Tropohumults Typic Humitropepts	40 40	I14 Andic Humitropepts Entic Dystrandepts Andic Tropohumults I22 Fluventic Ustic Dystropepts Typic Ustifluvents	Pluvius	Tropic	2500-4000	above 24	one wet season, April or May through November
23	U4	Typic Tropohumults Typic Humitropepts	40 40		Brum1-Pluvius/ Fluvi-Balneous	Tropic to Subtropic	2000-4000	18-24	one wet season, May through November
24	M3	Fluvaquentic Hapludolls Typic Tropepts Fluvaquentic Haplaquolls	30 30 20	E6 Typic Sulfaquents Tropic Fluvaquents	Pluvius	Tropic	2500-4000	above 24	one wet season, April or May through November
25	E6	Typic Sulfaquents Tropic Fluvaquents	40 40		Pluvius	Tropic	2500-4000	above 24	one wet season, May through November
26	U4	Typic Tropohumults Typic Humitropepts	40 40	I26 Typic Dystropepts Lithic Dystropepts Typic Troporthents	Madious	Tropic	more than 4000	above 24	one wet season, May through November
27	M3	Fluvaquentic Hapludolls Typic Tropepts Fluvaquentic Haplaquolls	30 30 20		Madious	Tropic	more than 4000	above 24	one wet season, May through November
28	E2	Typic Tropopsamments Typic Dystropepts	60 20		Pluvius	Tropic	2500-4000	above 24	one wet season, May through November
29	I9	Typic Dystrandepts	80		Madious	Tropic	more than 4000	above 24	one wet season, May through November

RESOURCE PLANNING UNITS - COSTA RICA

RPU No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil	Subdominant Soil	Percent composition	Other Soil Map Units	Crop Climate		Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
						Zone	Climate				
30	I6	Typic Dystrandepts Typic Vitrandepts Typic Hydrandepts		40 20 20		Pluvius		Tropic	2500-4000	above 24	one wet season, May through November
31	I6	Typic Dystrandepts Typic Vitrandepts Typic Hydrandepts		40 20 20	I22 Fluventic Ustic Dystrandepts Typic Ustifluvents	Pladous		Tropic	1500-2000	above 24	one wet season, May through November
32	I6	Typic Dystrandepts Typic Vitrandepts Typic Hydrandepts		40 20 20		Balneous		Tropic	2000-2500	above 24	one wet season, May through November
33	I6	Typic Dystrandepts Typic Vitrandepts Typic Hydrandepts		40 20 20	U4 Typic Tropohumults Typic Humitropepts	Madid		Tropic	more than 4000	above 24	one wet season, but grading to one wet season, May through November
34	I17	Ustic Humitropepts Andic Ustic Humitropepts		70 20	I33 Ustic Dystrandepts Ultic Haplustalfs	Balneous		Tropic	2000-2500	above 24	one wet season, May through November
35	I6	Typic Dystrandepts Typic Vitrandepts Typic Hydrandepts		40 20 20		Brumi-Pluvius/ Fluvi-Balneous		Tropic to Subtropic	2000-4000	18-24	one wet season, May through November
36	I17	Ustic Humitropepts Andic Ustic Humitropepts		70 20	I33 Ustic Dystrandepts Ultic Haplustalfs	Brumi-Pluvius/ Fluvi-Balneous		Tropic to Subtropic	2000-4000	18-24	one wet season, May through November
37	E5	Lithic Ustorthents Lithic Ustropepts Vertic Ustropepts		30 30 20		Brumi-Pluvius/ Fluvi-Balneous		Tropic to Subtropic	2000-4000	18-24	one wet season, May through October
38	I6	Typic Dystrandepts Typic Vitrandepts Typic Hydrandepts		40 20 20		Madious		Tropic	more than 4000	above 24	one wet season, May through January

RESOURCE PLANNING UNITS - COSTA RICA

RPU No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil Subdominant Soil	Percent composition	Other Soil Map Units	Crop Climate Zone	Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
39	I6	Typic Dystrandepts Typic Vitrandepts Typic Hydrandepts	40 20 20	I17 Ustic Humitropepts Andic Ustic Humitropepts I11 Lithic Dystrandepts Typic Dystrandepts Lava outcrops	Brumi-Pluvius	Tropic to Subtropic	2500-4000	18-24	one wet season May through November, grading to nonseasonal toward the east
40	I5	Typic Dystrandepts Typic Eutrandepts	60 30	I6 Typic Dystrandepts Typic Vitrandepts Typic Hydrandepts	Feraci-Pladous/ Fluvi-Balneous	Tropic to Subtropic	1500-2000	18-24	one wet season May through November
41	I7	Typic Dystrandepts Aquic Dystrandepts	50 20						
41	V2	Typic Pellusterts Ustic Humitropepts Vertic Ustropepts	40 20 20	I26 Typic Dystrandepts Lithic Dystrandepts Typic Troporthents	Feraci-Pladous/ Fluvi-Balneous	Tropic to Subtropic	1500-2000	18-24	one wet season May through October
42	I26	Typic Dystrandrepts Lithic Dystrandrepts Typic Troporthents	40 20 20	I14 Andic Humitropepts Entic Dystrandepts Andic Tropohumults	Brumi-Pluvius/ Fluvi-Balneous	Tropic to Subtropic	2000-4000	18-24	one wet season May through November
43	I30	Lithic Dystrandrepts Typic Dystrandrepts	40 40	I14 Andic Humitropepts Entic Dystrandepts Andic Tropohumults	Noto-Pluvius/ Nivi-Balneous/ Hiemo-Pluvius	Temperate to Subtropic	1500-4000	6-18	one wet season May through November
43	I26	Typic Dystrandrepts Lithic Dystrandrepts Typic Troporthents	40 20 20	U4 Typic Tropohumults Typic Humitropepts					
44	I12	Typic Humitropepts Andic Humitropepts Oxic Dystrandrepts	30 20 20	I15 Andic Ustic Humitropepts Aeric Tropaquepts	Feraci-Pladous/ Fluvi-Balneous	Tropic to Subtropic	1500-2500	18-24	one wet season May through November
45	I12	Typic Humitropepts Andic Humitropepts Oxic Dystrandrepts	30 30 20	I16 Fluventic Humitropepts Aeric Tropaquepts Typic Humitropepts	Brumi-Pluvius/ Fluvi-Balneous	Tropic to Subtropic	2000-4000	18-24	no wet season

RESOURCE PLANNING UNITS - COSTA RICA

RPV No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil Subdominant Soil	Percent composition	Other Soil Map Units	Crop Climate Zone	Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
46	I14	Andic Humitropepts Entic Dystrandepts Andic Tropohumults	40 20 20	I4 Typic Placandepts Typic Dystrandepts H3 Lithic Tropofolists Lithic Placandepts Lithic Tropofibrists	Noto-Pluvius/ Nivi-Balneous/ Hiemo-Pladous	Temperate to Subtropic	1500- 4000	6-18	one wet season May through November
47	U2	Ustoxic Palehumults Aeric Trophaepts	70 20		Brumi-Pluvius/ (Ø-Fluvi)-Bal- neous	Tropic to Subtropic	2000- 4000	18 and above depending on altitude	one wet season May through November
48	U3	Plinthic Palehumults Typic Humitropepts	40 40	U2 Ustoxic Palehumults Aeric Trophaepts	Brumi-Pluvius/ (Ø-Fluvi)-Bal- neous	Tropic to Subtropic	2000- 4000	18 and above depending on altitude	one wet season May through November
49	U4	Typic Tropohumults Typic Humitropepts	40 40		Brumi-Pluvius/ Fluvi-Balneous	Tropic to Subtropic	2000- 4000	18-24 on altitude	one wet season May through December
50	U2	Ustoxic Palehumults Aeric Trophaepts	70 20	I22 Fluventic Ustic Dystropepts Typic Ustifluvents	Pluvius to Brumi-Pluvius	Tropic to Subtropic	2500- 4000	18 and above depending on altitude	one wet season April through November
51	U3	Plinthic Palehumults Typic Humitropepts	40 40	U3 Plinthic Palehumults U2 Ustoxic Palehumults Aeric Trophaepts I21 Fluventic Ustropepts Fluventic Haplustolls	(Ø-Brumi)- Pluvius	Tropic to Subtropic	2500- 4000	18 and above depending on altitude	one wet season May through November
52	I30	Lithic Dystrupepts Typic Dystrupepts	40 40	U4 Typic Tropohumults Typic Humitropepts	Hydro-Madious	Tropic to Subtropic	more than 4000	18 and above depending on altitude	one wet season April or May through November
53	I13	Andic Humitropepts	I14	Andic Humitropepts Andic Tropohumults Entic Dystrupepts	Pluvius to Brumi-Pluvius and Madious	Subtropic	2500- more than 4000	18 and above depending on altitude	one wet season April through November

RESOURCE PLANNING UNITS - COSTA RICA

RPU No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil		Percent composition	Other Soil Map Units		Crop Climate Zone		Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
		Dominant Soil	Subdominant Soil									
54	I10	Hydric Dystrandepts	Typic Andaquepts	?	I31	Oxic Dystrupepts Aeric Tropanepts	Pladous		Tropic	1500-2000	above 24	one wet season May through November
	I27	Aquic Dystrupepts		70	I3	Typic Tropanepts Histic Tropanepts						
55	I31	Oxic Dystrupepts	Aeric Tropanepts	60 20	I26	Typic Dystrupepts Lithic Dystrupepts Typic Tropeorthents	Pluvius		Tropic	2500-4000	above 24	one wet season May through January, grading to nonseasonal to the south
56	I3	Typic Tropanepts	Histic Tropanepts	60 20			Pladous		Tropic	1500-2000	above 24	one wet season May through November
57	I27	Aquic Dystrupepts		70			Pluvius		Tropic	2500-4000	above 24	one wet season May through November
58	I35	Andic Humitropepts	Fluventic Dystrupepts Andic Dystrupepts	50 20 20	U5 I28 I6	Typic Paleudults Typic Humitropepts Andic Humitropepts Typic Dystrandepts Typic Vitrandepts Typic Hydrandepts	Pluvius		Tropic	2500-4000	above 24	one wet season May through January
59	I34	Andic Dystrupepts										
	I26	Typic Dystrupepts	Lithic Dystrupepts Typic Tropeorthents	40 20 20			Madid		Tropic	more than 4000	above 24	no wet season in the east; May through November in the west
60	I31	Oxic Dystrupepts	Aeric Tropanepts	60 20	E1	Typic Hydraquents Tropic Fluvaquents Histic Fluvaquents Hemic Tropofibrists Hemic Troposapristis Fluvaquentic Troposapristis	Madid		Tropic	more than 4000	above 24	no wet or dry season

RESOURCE PLANNING UNITS - COSTA RICA

RPU No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil Subdominant Soil	Percent composition	Other Soil Map Units	Crop Climate		Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
					Zone	Climate				
61	I55	Andic Humitropepts Fluventic Dystropepts Andic Dystropepts	50 20 20		Madid		Tropic	more than 4000	above 24	no wet or dry season
62	E1	Typic Hydraquents Tropic Fluvaquents Histic Fluvaquents	30 30 30	E3 Typic Troposamments Typic Troporthents Hemic Tropofibrists Hemic Troposaprists Fluvaquentic Troposaprists	Madid		Tropic	more than 4000	above 24	no wet or dry season
63	U1	Oxic Palehumults Aeric Tropaquepts	60 20	E1 Typic Hydraquents Tropic Fluvaquents Histic Fluvaquents Hemic Tropofibrists Hemic Troposaprists Fluvaquentic Troposaprists Typic Tropaquepts Aeric Tropic Fluvaquents	Madid		Tropic	more than 4000	above 24	no wet or dry season
64	I2	Typic Tropaquepts Aeric Tropic Fluvaquents	50 30	U1 Oxic Palehumults Aeric Tropaquepts Hemic Tropofibrists Hemic Troposaprists	Madid		Tropic	more than 4000	above 24	no wet or dry season
65	I9	Typic Dystrandeps	80	I8 Aeric Dystrandeps	Madid		Tropic	more than 4000	above 24	no wet or dry season
66	H2	Lithic Troposaprists Histic Lithic Tropaquepts	50 30		Madid		Tropic	more than 4000	above 24	no wet or dry season
67	U1	Oxic Palehumults Aeric Tropaquepts	60 20		Pluvial		Tropic	2500- 4000	above 24	no dry season

RESOURCE PLANNING UNITS - COSTA RICA

RPU No. (12/1/79)	Dominant Soil Map Unit (March 1978)	Dominant Soil Subdominant Soil	Percent composition	Other Soil Map Units	Crop Climate Zone	Zone	Average Annual Precip. (mm)	Average Annual Temp. Range (°C)	Seasonality
68	I2	Typic Tropaeuqpts Aeric Tropic Fluvaquents	50 30	I6 H1 Fluventic Humitropaepts Aeric Tropaeuqpts Typic Humitropaepts Hemic Tropaeufibrists Hemic Tropaeuqprists Fluvaquentic Tropaeuqprists	Madid	Tropic	more than 4000	above 24	no wet or dry season
69	I2	Typic Tropaeuqpts Aeric Tropic Fluvaquents	50 30	I6 H1 Fluventic Humitropaepts Aeric Tropaeuqpts Typic Humitropaepts Hemic Tropaeufibrists Hemic Tropaeuqprists Fluvaquentic Tropaeuqprists	Pluvid	Tropic	2500-4000	above 24	no dry season
70	U4	Typic Tropaeuqmult Typic Humitropaept	40 40	U1 I2 I16 Oxic Palehumults Aeric Tropaeuqpts Typic Tropaeuqpts Aeric Tropic Fluvaquents Andic Humitropaepts Entic Dystrandepsts Andic Tropaeuqmults	Pluvid	Tropic	2500-4000	above 24	no dry season
71	I16	Fluventic Humitropaepts Aeric Tropaeuqpts Typic Humitropaepts	30 30 30	I2 E1 U1 Typic Tropaeuqpts Aeric Tropic Fluvaquents Histic Fluvaquents Oxic Palehumults Aeric Tropaeuqpts	Balneid/ Balneal	Tropic	1500-2500	above 24	two wet seasons, March through July and November through January grading to no wet season toward the southern border
72	E4	Typic Tropaeuqpts	70	I16 U1 Andic Humitropaepts Entic Dystrandepsts Andic Tropaeuqmults Oxic Palehumults Aeric Tropaeuqpts	Pluvious-Pluvid also Balneous-Balneid and Pladal	Tropic	2500-4000 1500-2500	above 24	no wet season in center, grading to one wet season in west, May through November & to March through July & November through January in the east

APPENDIX A: Descriptive Sheets for the Map Units on the Soil Map of Costa Rica

Símbolo: Al

Ubicación: _____

Componentes: 1. Typic Haplustalfs

2. Typic Ustropepts

3. Vertic Ustropepts

Paisaje: _____

Material de partida: _____

Material subyacente: _____

Elevación: _____

Temperatura media anual: _____

Precipitación media anual: _____

Meses secos: _____

	Componentes		
Características	1	2	3

Pendientes _____

Clase de drenaje _____

Profundidad a la roca _____

Textura - suelo _____

- subsuelo _____

Fragmentos rocosos del perfil _____

Capacidad de retener agua _____

Permeabilidad _____

Inundaciones Encharcamientos _____

Reacción _____

Saturación de bases _____

Grado de limitaciones _____

para cultivos perennes _____

para cultivos anuales _____

para pastos _____

para mecanización _____

Susceptibilidad a erosión _____

Limitaciones para uso _____

Símbolo: H1

Nombre: _____

Composición: 1. ~~Type Troposapristis~~ Homo Troposapristis 40%
3. Fluvagueria Troposapristis 20%
2. Homo Troposapristis 40%

Paisaje: Pantano ~~centro~~, plano

Material de partida: Material orgánico (turba)

Material subyacente: Igual, con capitas de aluvión en 3.

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: < 1

Características y calificaciones

Componentes

Pendientes:

1
~~0-2~~ %

2
0-2 %

3
0-2 %

Clase de drenaje

muy pobre

muy pobre

muy pobre

Profundidad a la roca

> 2 m

> 2 m

> 2 m

Textura superficial

turbosa
orgánica

orgánica

orgánica

Granulometría

Fragmentos rocosos del perfil

< 5 %

< 5 %

< 5 %

Capacidad de retener agua

> 20 cm

> 20 cm

> 20 cm

Permeabilidad

rápida

rápida

no. lenta

Inundaciones Encharcamientos

permanentes

permanentes

permanentes

Reacción

fuertemente
ácida

f. ácida

f. ácida

Saturación de bases

baja

baja

baja

Sales Sodio Aluminio

Grado de limitaciones

para cultivos ^{permanentes}

muy fuerte

muy fuerte

muy fuerte

para pastos

muy fuerte

muy fuerte

muy fuerte

para mecanización

muy fuerte

muy fuerte

muy fuerte

Susceptibilidad a erosión

Baja

baja

baja

Limitaciones para uso

agua

agua

agua

Los Chiles

Símbolo: H2

Nombre: _____

Composición: 1. Lithic Tropaeprists 50%
2. Lithic Tropaeprists 30%

Paisaje: Pantano costero, plano

Material de partida: 1. Material orgánico; 2. Aluvión

Material subyacente: Roca dura

Elevación: _____

Temperatura anual: _____

Precipitación anual: > 5,000 mm

Meses secos: < 1

Características y calificaciones

Componentes

1

2

3

Pendientes:

0-2%

0-2%

Clase de drenaje

muy pobre

muy pobre

Profundidad a la roca

< 0.5 m

< 0.5 m

Textura superficial

orgánica turbosa

turbosa orgánica

Granulometría

—

franco

Fragmentos rocosos del perfil

< 5%

< 5%

Capacidad de retener agua

15-20 cm

5-10 cm

Permeabilidad

rápida

mod. lenta

Inundaciones Encharcamientos

permanentes

frecuentes

Reacción

fuertemente ácida

fuertemente ácida

Saturación de bases

baja

baja

~~Sal~~ Sodio Aluminio

—

—

Grado de limitaciones

para cultivos ^{perennes} anuales

muy fuerte
muy fuerte

muy fuerte
muy fuerte

para pastos

muy fuerte

muy fuerte

para mecanización

muy fuerte

muy fuerte

Susceptibilidad a erosión

baja

baja

Limitaciones para uso

agua

agua

Costa Atlántica norte de Siquirres

Símbolo: H 3

Nombre: _____

Ubicación: _____

Composición: 1. Lithic Tropofolists 40%
2. Lithic Placandeps 20%
3. Lithic Tropo Sibrists 20%

Paisaje: Cumbre de montaña
con pendientes de _____

Material de partida: (1) Material orgánico : (2) Cenizas

Material subyacente: Roca dura

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y
calificaciones

Componentes

	1	2	3
Pendientes	15-60%	5-15%	0-5%
Clase de drenaje	bucala	mod. -	mod. pobre
Profundidad a la roca	0.5-1 m	<0.5 m	0.5-1 m
Textura: superficial suelo	turbosa	franca	turbosa
Granulometría subsuelo	(roca)	franca	(roca)
Fragmentos rocosos del perfil	<5%	<5%	<5%
Capacidad de retener agua	>20 cm	10-15 cm	15-20 cm
Permeabilidad	mod. rápida	mod. lenta	mod. rápida
Inundaciones Encharcamientos	huica	mod. -	permanentes
Reacción	f. ácida	f. ácida	f. ácida
Saturación de bases	baja	baja	baja
Salos Sodio Aluminio			
Grado de limitaciones para cultivos ^{permanentes} para pastos ^{anuales}	muy fuerte muy fuerte	muy fuerte muy fuerte	muy fuerte muy fuerte
para mecanización	muy fuerte	ligero	muy fuerte
Susceptibilidad a erosión	muy alta	alta	baja
Limitaciones para uso	frío	frío	frío
	fertilidad pendiente	profundidad	agua

Cordillera de Talamanca

Símbolo: E 1

Nombre: _____

Composición: 1. Typic Hydraquents 30 %
2. Typic Fluvaquents 30 %
3. Histic Fluvaquents 30 %

Paisaje: Vegas pantanosas costeras
con pendientes de 0 a 2 %.

Material de partida: Aluvión

Material subyacente: Igual

Elevación: De 0 a 5 m

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones	Componentes		
	1	2	3

Pendientes	0-2%	0-2%	0-2%
------------	------	------	------

Clase de drenaje	muy pobre	muy pobre	muy pobre
------------------	-----------	-----------	-----------

Profundidad a la roca	> 2 m	> 2 m	> 2 m
-----------------------	-------	-------	-------

Textura superficial suelo	franca	franca	orgánica
------------------------------	--------	--------	----------

Granulometría ^{suelo}	franca	franca	franca
--------------------------------	--------	--------	--------

Fragmentos rocosos del perfil	< 5 %	< 5 %	< 5 %
-------------------------------	-------	-------	-------

Capacidad de retener agua	15-20 cm	15-20 cm	> 20 cm
---------------------------	----------	----------	---------

Permeabilidad	mod. lenta	mod. lenta	mod. lenta
---------------	------------	------------	------------

Inundaciones ⁽²⁾ Encharcamientos ^(1,3)	permanentes	frecuentes	permanentes
--	-------------	------------	-------------

Reacción	lig. ácida	lig. ácida	lig. ácida
----------	------------	------------	------------

Saturación de bases	alta	alta	alta
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~~Sal~~ ~~Sodio~~ ~~Aluminio~~

Grado de limitaciones ^{permanentes}	muy fuerte	muy fuerte	muy fuerte
--	------------	------------	------------

para cultivos ^{temporales}	muy fuerte	muy fuerte	muy fuerte
-------------------------------------	------------	------------	------------

para pastos	muy fuerte	muy fuerte	muy fuerte
-------------	------------	------------	------------

para mecanización	muy fuerte	muy fuerte	muy fuerte
-------------------	------------	------------	------------

Susceptibilidad a erosión	baja	baja	baja
---------------------------	------	------	------

Limitaciones para uso	agua	agua	agua
-----------------------	------	------	------

Símbolo: \rightarrow

Nombre: _____

Composición: 1. Typic Tropopsamments 60%
 2. Typic Dystrypops 20%
 3. _____

Paisaje: Playas y terrazas costeras
 con pendientes de 0 a 5 %

Material de partida: Arena de la playa

Material subyacente: Igual

Elevación: De 0 a 5 m

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	<u>1</u>	<u>2</u>	<u>3</u>
Pendientes	0-5 %	0-5 %	
Clase de drenaje	buena	buena	
Profundidad a la roca	> 2 m	> 2 m	
Textura superficial	arenosa	arenosa	

Granulometría sub suelo

arenosa

franco

Fragmentos rocosos del perfil

< 5 %

< 5 %

Capacidad de retener agua

< 5 cm

5-10 cm

Permeabilidad

muy rápida

med. rápida

Inundaciones Encharcamientos

nunca

nunca

Reacción

suavemente ácido

f. ácido

Saturación de bases

media

media

~~Sal~~ Sodio Aluminio

Grado de limitaciones

para cultivos ^{perennes} _{arboles}

muy fuerte

moderado fuerte

para pastos

muy fuerte

moderado

para mecanización

ligero

ligero

Susceptibilidad a erosión

alta \cup

media \cup

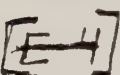
Limitaciones para uso

textura

textura

1. Por viento.

E3

Símbolo: 

Nombre: _____

Composición: 1. Typic Tropo psamments 40 %
 2. Typic Tropo tllis 40 %
 3. _____

Paisaje: Playas
 con pendiente de 0 a 5 %

Material de partida: Arena de la playaMaterial subyacente: IgualElevación: De 0 a 5 m

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes		
	1	2	3

Pendientes	0-5%	0-5%	
------------	------	------	--

Clase de drenaje	buena	buena	
------------------	-------	-------	--

Profundidad a la roca	> 2 m	> 2 m	
-----------------------	-------	-------	--

Textura superficial suelo	arenosa	franca	
------------------------------	---------	--------	--

Granulometría subsuelo	arenosa	franca	
------------------------	---------	--------	--

Fragmentos rocosos del perfil	< 5%	< 5%	
-------------------------------	------	------	--

Capacidad de retener agua	< 5 cm	5-10 cm	
---------------------------	--------	---------	--

Permeabilidad	muy rápida	mod. rápida	
---------------	------------	-------------	--

Inundaciones Encharcamientos	nunca	nunca	
------------------------------	-------	-------	--

Reacción	f. ácida	f. ácida	
----------	----------	----------	--

Saturación de bases	media	media	
---------------------	-------	-------	--

Sales Sodio Aluminio _____

Grado de limitaciones _____

para cultivos ^{perennes} anuales	muy fuerte	moderado
---	------------	----------

para pastos	muy fuerte	ligero
-------------	------------	--------

para mecanización	ligero	ligero
-------------------	--------	--------

Susceptibilidad a erosión	alta	baja
---------------------------	------	------

Limitaciones para uso	textura	espuma del mar
-----------------------	---------	----------------

1. Por viento

Símbolo: _____

Nombre: _____

Composición: 1. Typic Troorthents 70%

2. _____

3. _____

Paisaje: Terrazas fluviales

con pendientes de 0 a 5%

Material de partida: Aluvión

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones	Componentes		
	1	2	3
Pendientes	0-5%		
Clase de drenaje	buena		
Profundidad a la roca	> 2 m		
Textura superficial suelo	arenosa (pedregosa)		
Granulometría superficial	arenosa		
Fragmentos rocosos del perfil	20-35%		
Capacidad de retener agua	0-5 cm		
Permeabilidad	mod. rápida		
Inundaciones Encharcamientos	raras		
Reacción	s. ácida		
Saturación de bases	media		
Sales Sodio Aluminio			
Grado de limitaciones para cultivos	moderado moderado		
para pastos	ligero		
para mecanización	fuerte		
Susceptibilidad a erosión	baja		
Limitaciones para uso	fragmentos rocosos		

E5

Símbolo:

Nombre:

Composición:	1. Litho	Ostrea lith.	30%
	2. Litho	Ostrea lith.	30%
	3. Litho	H. pluvialis	20%

Paisaje: Montañas bajas

Material de partida: Materiales coloniales y residuales

Material subyacente: Roca dura

Elevación:

Temperatura anual:

Precipitación anual:

Meses secos:

Características y calificaciones

Componentes

1

2

3

Pendientes 30-60% 30-60% 15-45%

Clase de drenaje buena buena buena

Profundidad a la roca <0.5 m <0.5 m <0.5 m

Textura: superficial fuerte fuerte fuerte

Granulometría sub-suelo (roca) (roca) (roca)

Fragmentos rocosos del perfil 5-20% 5-20% <5%

Capacidad de retener agua 5-10 cm 5-10 cm 5-10 cm

Permeabilidad moderada moderada moderada

Inundaciones Encharcamientos nunca nunca nunca

Reacción lig. ácida lig. ácida lig. ácida

Saturación de bases alta alta alta

Sales Sodio Aluminio

Grado de limitaciones

para cultivos ^{perennes} _{arboles} muy fuerte muy fuerte muy fuerte

para pastos fuerte fuerte fuerte

para mecanización muy fuerte muy fuerte muy fuerte

Susceptibilidad a erosión muy alta muy alta muy alta

Limitaciones para uso profundidad profundidad profundidad

Paisaje: Montañas bajas

Material de partida: Roca dura

Símbolo: _____

Nombre: _____

Composición: 1. Typic Sulfaguents 40%
 2. Typic Fluvaquents 40%
 3. _____

Paisaje: Pantano de las marcas con manglares
 con pendientes de 0 a 2 %

Material de partida: Aluvión

Material subyacente: Igual

Elevación: De 0 a 1 m

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-2%	0-2%	
Clase de drenaje	muy pobre	muy pobre	
Profundidad a la roca	> 2 m	> 2 m	
Textura: superficial suelo	franco	franco	

Granulometría subsuelo

franco

franco

Fragmentos rocosos del perfil

< 5 %

< 5 %

Capacidad de retener agua

15-20 cm

15-20 cm

Permeabilidad

mod. lenta

mod. lenta

Inundaciones Encharcamientos

permanentes

frecuentes

Reacción

lig. ácido

lig. ácido

Saturación de bases

alta

alta

Sales Sodio Aluminio

Grado de limitaciones

para cultivos

muy fuerte

muy fuerte

para pastos

muy fuerte

muy fuerte

para mecanización

muy fuerte

muy fuerte

Susceptibilidad a erosión

baja

baja

Limitaciones para uso

erosión

inundaciones

inundaciones

inundaciones

1. Se baja a extremadamente
 ácido con el drenaje

Símbolo: _____

Ubicación: _____

Componentes: 1. Typic Tropaquepts ~~[Tropaquepts]~~
 2. Tropic Fluvaquents
 3. Udic Pellusterts

Paisaje: _____

Material de partida: _____

Material subyacente: _____

Elevación: _____

Temperatura media anual: _____

Precipitación media anual: _____

Meses secos: _____

Componentes

Características

1

2

3

Pendientes _____

Clase de drenaje _____

Profundidad a la roca _____

Textura - suelo _____

- subsuelo _____

Fragmentos rocosos del perfil _____

Capacidad de retener agua _____

Permeabilidad _____

Inundaciones Encharcamientos _____

Reacción _____

Saturación de bases _____

Grado de limitaciones _____

para cultivos perennes _____

para cultivos anuales _____

para pastos _____

para mecanización _____

Susceptibilidad a erosión _____

Limitaciones para uso _____

Símbolo:

Nombre:

Composición: 1. Typic Tropaquepts 50 %
 2. Aeritropic Fluvaquents 30 %
 3.

Paisaje: Bajos ^{y vegas} en el planicie costero
 con pendientes de 0 a 2 %

Material de partida: Aluvión

Material subyacente: Igual

Elevación:

Temperatura anual:

Precipitación anual:

Meses secos: < 1

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-2%	0-2%	
Clase de drenaje	muy pobre	pobre	
Profundidad a la roca	> 2 m	> 2 m	
Textura: superficial suelo	franca	franca	
Granulometría subsuelo	arcillosa	franca	
Fragmentos rocosos del perfil	< 5%	5-20%	
Capacidad de retener agua	15-20 cm	15-20 cm	
Permeabilidad	lenta	mod. lenta	
Inundaciones ⁽²⁾ Encharcamientos ⁽¹⁾	frecuentes	frecuentes	
Reacción	fuertemente ácida	mod. ácida	
Saturación de bases	media	media	
Sal Sodio Aluminio			
Grado de limitaciones para cultivos ^{perennes} anuales	muy fuerte	muy fuerte	
para pastos	fuerte	fuerte	
para mecanización	muy fuerte	fuerte	
Susceptibilidad a erosión	baja	baja	
Limitaciones para uso	drenaje	drenaje inundaciones	

Símbolo:

Nombre: _____

Composición: 1. Typic Tropaquepts 60 %
 2. Histic Tropaquepts 20 %
 3. _____

Paisaje: Pantano

con pendientes de 0 a 2 %

Material de partida: Material lacustre o aluvión

Material subyacente: _____

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-2 %	0-2 %	
Clase de drenaje	muy pobre	muy pobre	
Profundidad a la roca	> 2 m	> 2 m	
Textura: superficial suelo	franca	orgánica	
Granulometría subsuelo	arcillosa	arcillosa	
Fragmentos rocosos del perfil	< 5 %	< 5 %	
Capacidad de retener agua	15-20 cm	> 20 cm	
Permeabilidad	lenta	lenta	
Inundaciones Encharcamientos	frecuentes	permanentes	
Reacción	mod. ácida	mod. ácida	
Saturación de bases	media	media	
Salos Sodio Aluminio	—	—	
Grado de limitaciones para cultivos ^{terrestres}	muy fuerte	muy fuerte	
para pastos	fuerte	fuerte	
para mecanización	muy fuerte	muy fuerte	
Susceptibilidad a erosión	baja	baja	
Limitaciones para uso	drenaje	drenaje	

Símbolo: I 4

Nombre: _____

Composición: 1. Type Placandopts 40 %
2. Type Dystrochpts 40 %
3. _____

Paisaje: Montañas

con pendientes de

Material de partida: Cenizas

Material subyacente: Roca dura

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

Pendientes

1

5-30 %

2

15-45 %

3

Clase de drenaje

imperfecta

bueno

Profundidad a la roca

0.5-1 m. U

> 2 m

Textura superficial
suelo

franca

franca

Granulometría ^{de} suelo

franca

franca

Fragmentos rocosos del perfil

< 5 %

< 5 %

Capacidad de retener agua

10-15 cm

> 20 cm

Permeabilidad

mod. lenta

moderada

Inundaciones Encharcamientos

nunca

nunca

Reacción

f. ácida

f. ácida

Saturación de bases

bajo

bajo

~~Sal~~ Sodio Aluminio

Grado de limitaciones

para cultivos ^{potenciales} ~~potenciales~~

muy fuerte
muy fuerte

muy fuerte
muy fuerte

para pastos

moderado

moderado

para mecanización

moderado

fuerte

Susceptibilidad a erosión

moderada

moderada

Limitaciones para uso

frio

frio

profundidad

profundidad

1. Profundidad a una capa impermeable.

Cordillera de Talamanca

Símbolo: I 5

Nombre: _____

Composición: 1. Typic Dystrandepts 60 %
2. Typic Fluvisols 30 %
3. _____

Paisaje: Colinas volcánicas

Material de partida: Cenizas

Material subyacente: _____

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes		
	1	2	3

Pendientes	15-30 %	15-30 %	
------------	---------	---------	--

Clase de drenaje	bucna	bucna	
------------------	-------	-------	--

Profundidad a la roca	> 2 m	> 2 m	
-----------------------	-------	-------	--

Textura superficial suelo	franca	franca	
------------------------------	--------	--------	--

Granulometría subsuelo	franca	franca	
------------------------	--------	--------	--

Fragmentos rocosos del perfil	< 5 %	< 5 %	
-------------------------------	-------	-------	--

Capacidad de retener agua	> 20 cm	> 20 cm	
---------------------------	---------	---------	--

Permeabilidad	moderada	mod. rápido	
---------------	----------	-------------	--

Inundaciones Encharcamientos	nunca	nunca	
------------------------------	-------	-------	--

Reacción	mod. ácida	lig. ácida	
----------	------------	------------	--

Saturación de bases	media	alta	
---------------------	-------	------	--

Sales Sodio Aluminio			
----------------------	--	--	--

Grado de limitaciones para cultivos ^{perman.}	ligero	ligero	
---	--------	--------	--

para pastos	ligero	ligero	
-------------	--------	--------	--

para mecanización	fuerte	fuerte	
-------------------	--------	--------	--

Susceptibilidad a erosión	alta	alta	
---------------------------	------	------	--

Limitaciones para uso	pendientes seguir	pendientes seguir	
-----------------------	----------------------	----------------------	--

Símbolo: I 6

Ubicación: Cord. Ilera Central; frontera paraguayo a Villa Nro.

Componentes: 1. Typic Dystrandepts 40 %
2. Typic Vitrandepts 20 %
3. Typic Hydrandepts 20 %

Paisaje: Montañas volcánicas
con pendientes de 5 a 30 %

Material de partida: Cenizas

Material subyacente: Igual

Elevación:

Temperatura media anual:

Precipitación media anual:

Meses secos:

Características	Componentes		
	1	2	3
Pendientes	5-30 %	5-30 %	5-30 %
Clase de drenaje	buena	buena	buena
Profundidad a la roca	> 2 m	> 2 m	> 2 m
Textura - suelo	franco	franco	arenoso
- subsuelo	franco	franco	arenoso
Fragmentos rocosos del perfil	< 5 %	< 5 %	< 5 %
Capacidad de retener agua	> 20 cm	> 20 cm	> 20 cm
Permeabilidad	moderada	mod. bpt.	mod. bpt.
Inundaciones Encharcamientos	raras	raras	raras
Reacción	fría	mod. fría	mod. fría
Saturación de bases	baja	mod.	baja
Grado de limitaciones			
para cultivos perennes	ligero	fuerte	ligero
para cultivos anuales	ligero	fuerte	fuerte
para pastos	ligero	moderado	ligero
para mecanización	fuerte	fuerte	fuerte
Susceptibilidad a erosión	lig.	mod.	fuerte
Limitaciones para uso	pendientes ácidez	frío pendientes	lluvias ácidez pendientes

Símbolo: I 7

Nombre: _____

Composición: 1. Aquic Dystrandepts 20 %
2. I. Typ Dystrandepts 50 %
3. _____

Paisaje: Montañas - volcánicas
con pendientes de 5 a 30 %

Material de partida: Cenizas

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	5-30 %	5-15 %	
Clase de drenaje	buena	imperfecta	
Profundidad a la roca	> 2 m	> 2 m	
Textura: superficial Suelo	franca	franca	
Granulometría s. b. suelo	franca	arcillosa	
Fragmentos rocosos del perfil	< 5 %	< 5 %	
Capacidad de retener agua	> 20 cm	> 20 cm	
Permeabilidad	moderada	mod. lenta	
Inundaciones Encharcamientos	nunca	nunca	
Reacción	f. ácida	f. ácida	
Saturación de bases	baja	media	
Sal Sodio Aluminio			
Grado de limitaciones para cultivos ^{perennes} _{arboles}	ligero	fuerte	
para pastos	ligero	moderado	
para mecanización	ligero	ligero	
Susceptibilidad a erosión	fuerte	moderado	
Limitaciones para uso	media	media	
	pendiente árida	drenaje pendiente	

Heredia

San José

Cordillera Central

Símbolo: I 8

Nombre: _____

Composición: 1. Aguir Dystrandeps 70 %
2. _____
3. _____

Paisaje: Planicie o abanico aluvial
con pendientes de 0 a 5 %

Material de partida: Cenizas en depósitos directos o aluviales

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones	Componentes		
	1	2	3

Pendientes	0-5 %		
------------	-------	--	--

Clase de drenaje	moderada		
------------------	----------	--	--

Profundidad a 1 ^a roca	> 2 m		
-----------------------------------	-------	--	--

Textura: superficial suelo	franco		
-------------------------------	--------	--	--

Granulometría subsuelo	franco		
------------------------	--------	--	--

Fragmentos rocosos del perfil	< 5 %		
-------------------------------	-------	--	--

Capacidad de retener agua	> 20 cm		
---------------------------	---------	--	--

Permeabilidad	moderada		
---------------	----------	--	--

Inundaciones Encharcamientos	nunca		
------------------------------	-------	--	--

Reacción	mod. ácida		
----------	------------	--	--

Saturación de bases	baja		
---------------------	------	--	--

Salas Sodio-Aluminio	-		
----------------------	---	--	--

Grado de limitaciones para cultivos ^{perennes} _{anuales}	moderado moderado		
---	----------------------	--	--

para pastos	ligero		
-------------	--------	--	--

para mecanización	ligero		
-------------------	--------	--	--

Susceptibilidad a erosión	baja		
---------------------------	------	--	--

Limitaciones para uso	lluvias drenaje		
-----------------------	--------------------	--	--

Quapiles S. Quintes

Símbolo: I 9

Nombre: _____

Composición: 1. Typic Dystrandpts 80%

2. _____

3. _____

Paisaje: Terrazas aluviales

con pendientes de 0 a 5%

Material de partida: Aluvión derivado de cenizas

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: < 1

Características y calificaciones

Componentes

Pendientes

0-5%

Clase de drenaje

bueno

Profundidad a la roca

> 2 m

Textura: superficial
suelo

franca

Granulometría suelo

franca

Fragmentos rocosos del perfil

< 5%

Capacidad de retener agua

> 20 cm

Permeabilidad

moderada

Inundaciones Encharcamientos

nunca

Reacción

mod. ácida

Saturación de bases

baja

Salos Sodio Aluminio

Grado de limitaciones

para cultivos

perennes
anuales

ligero
moderado

para pastos

ligero

para mecanización

ligero

Susceptibilidad a erosión

baja

Limitaciones para uso

fijación
de fósforo
lluvias

Símbolo: I 10

Nombre: _____

Composición: 1. Hydric Dystrochlopts
2. Typic Andaquepts
3. _____

Paisaje: Planicie

con pendientes de 0 a 5%

Material de partida: Cenizas depositadas por aire o agua

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-5%	0-2%	
Clase de drenaje	bueno	pobre	
Profundidad a la roca	> 1 m	> 2 m	
Textura superficial suelo	arcillosa	arenosa	

Granulometría sub-suelo

Fragmentos rocosos del perfil

Capacidad de retener agua

Permeabilidad

Inundaciones Encharcamientos

Reacción

Saturación de bases

~~Salas Sodio Aluminio~~

Grado de limitaciones

para cultivos ^{perennes} _{anuales}

para pastos

para mecanización

Susceptibilidad a erosión

Limitaciones para uso

ligero	muy fuerte
moderado	fuerte
ligero	moderado
ligero	moderado
baja	baja
lluvias	drenaje
aridez	lluvias
	aridez

$U_F = 1_0$

Símbolo: I 11

Nombre: _____

Composición: 1. L. Thir Dystrochloids 40 %
2. Typic Dystrochloids 20 %
3. Aflorenados de lava 20 %

Paisaje: _____

Material de partida: _____

Material subyacente: _____

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	15-100%	3-30%	15-100%
Clase de drenaje	bueno	bueno	—
Profundidad a la roca	<0.5 m	1-2 m	0
Textura superficial suelo	franca	franca	—
Granulometría ^{suelo}	(roca)	franca	—
Fragmentos rocosos del perfil	20-35%	5-20%	—
Capacidad de retener agua	5-10 cm	>20 cm	0
Permeabilidad	mod. rápida	mod. rápida	—
Inundaciones Encharcamientos	ninguna	ninguna	ninguna
Reacción	f. ácida	f. ácida	—
Saturación de bases	baja	baja	—
Sal Sodio Aluminio			
Grado de limitaciones para cultivos ^{perennos arboles}	fuerte moderado	ligero ligero	inútil
para pastos	moderado	ligero	
para mecanización	muy fuerte	muy fuerte	
Susceptibilidad a erosión	baja	media	
Limitaciones para uso	riesgosidad	riesgosidad	

Cordillera Central

Cordillera de T. la...

Símbolo: J 12

Nombre: _____

Composición: 1. Typic Humitropepts 30%
2. Andic Humitropepts 30%
3. Oxic Dystiopepts 20%

Paisaje: Colinas (pie de norte)
con pendientes de 5 a 30%

Material de partida: Cenizas y materiales coluviales y resaca

Material subyacente: _____

Elevación: De 600 a 1.500 m

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes		
	1	2	3

Pendientes	5-30%	5-30	5-15%
------------	-------	------	-------

Clase de drenaje	bueno	bueno	bueno
------------------	-------	-------	-------

Profundidad a la roca	>2 m	>2 m	>2 m
-----------------------	------	------	------

Textura: superficial Suelo	arcillosa	arcillosa	arcillosa
-------------------------------	-----------	-----------	-----------

Granulometría subsuelo	arcillosa	arcillosa	arcillosa
------------------------	-----------	-----------	-----------

Fragmentos rocosos del perfil	<5%	<5%	<5%
-------------------------------	-----	-----	-----

Capacidad de retener agua	15-20 cm	>20 cm	15-20 cm
---------------------------	----------	--------	----------

Permeabilidad	mod. lenta	mod. lent.	lenta
---------------	------------	------------	-------

Inundaciones Encharcamientos	nunca	nunca	nunca
------------------------------	-------	-------	-------

Reacción	f. ácida	f. ácida	muy f. ácida
----------	----------	----------	--------------

Saturación de bases	media	media	baja
---------------------	-------	-------	------

~~Sal~~ ~~Sodio~~ ~~Aluminio~~

Grado de limitaciones para cultivos ^{perennes} _{anuales}	ligero moderado	ligero moderado	moderado moderado
--	--------------------	--------------------	----------------------

para pastos	ligero	ligero	ligero
-------------	--------	--------	--------

para mecanización	fuerte	fuerte	moderado
-------------------	--------	--------	----------

Susceptibilidad a erosión	alta	alta	media
---------------------------	------	------	-------

Limitaciones para uso	pendientes lluvias	pendientes lluvias	acidez pendientes lluvias
-----------------------	-----------------------	-----------------------	---------------------------------

Para la Torreña

Símbolo: J 13 (

Nombre: _____

Composición: 1. Andic Humitropops 70 %
2. _____
3. _____

Paisaje: Mesetas y colinas
con pendientes de 15 a 60 %

Material de partida: Cenizas

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

1

2

3

Pendientes

15-30%

Clase de drenaje

bueno

Profundidad a la roca

> 2 m

Textura: superficial
suelo

arcillosos

Granulometría subsuelo

arcillosos

Fragmentos rocosos del perfil

< 5 %

Capacidad de retener agua

> 20 cm

Permeabilidad

mod. lenta

Inundaciones Encharcamientos

bajas

Reacción

ácida

Saturación de bases

media

~~Salos Sodio Aluminio~~

Grado de limitaciones

para cultivos ^{perennes} anuales

ligero
moderado

para pastos

ligero

para mecanización

fuerte

Susceptibilidad a erosión

alta

Limitaciones para uso

pendiente
lluvias
ácido

San Vito

Cerro Hondo de Toluca

Símbolo: I 14

Nombre: _____

Composición: 1. Andic Humitropops 40 %
2. Andic Tropohumits 20 %
~~3. L. th. Humitropops 20 %~~
- 2. Entic Tropohumits

Paisaje: Montañas

con pendientes de 15 a 60 %

Material de partida: Cenizas y materiales coluviales recientes

Material subyacente: Roca sedimentaria med-médica

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Pendientes 30-60% 15-45% 15-30%

Clase de drenaje buena buena buena

Profundidad a la roca 1-2 m > 2 m > 2 m

Textura: superficial arcillosa franca arcillosa
suelo

Granulometría subsuelo arcillosa franca arcillosa

Fragmentos rocosos del perfil 5-20% < 5% 5-20%

Capacidad de retener agua 15-20 cm 7-20 cm 15-20 cm

Permeabilidad mod lenta moderada mod lenta

Inundaciones Encharcamientos nunca nunca nunca

Reacción f. ácida f. ácida f. ácida

Saturación de bases media baja media

~~Salas Sedro Atumnio~~

Grado de limitaciones para cultivos ^{perennes} _{anuales} ligero moderado ligero moderado ligero moderado

para pastos ligero ligero ligero

para mecanización muy fuerte fuerte fuerte

Susceptibilidad a erosión muy alta alta alta

Limitaciones para uso pendientes pendientes pendientes

lluvias acidez lluvias acidez lluvias acidez

Cordillera T. L. L. L.

Símbolo: I 15

Nombre:

Composición: 1. Andic Ustic Humitropepts 60 %
2. Aeritropaquepts 20 %
3.

Paisaje: Colinas (pie del monte) y valles
con pendientes de 0 a 30 %.

Material de partida: (1) Cerizos antiguos; (2) aluvión

Material subyacente: Igual

Elevación:

Temperatura anual:

Precipitación anual:

Meses secos:

Características y calificaciones

	Componentes		
	1	2	3
Pendientes	5-30%	0-5%	
Clase de drenaje	buena	pobre	
Profundidad a la roca	> 2 m	> 2 m	
Textura: superficial suelo	arcillosa	franca	
Granulometría subsuelo	arcillosa	arcillosa	
Fragmentos rocosos del perfil	< 5%	5-20%	
Capacidad de retener agua	> 20 cm	15-20 cm	
Permeabilidad	mod lenta	lenta	
Inundaciones Encharcamientos	nunca	raras	
Reacción	mod ácido	mod ácido	
Saturación de bases	media	media	
Sal Sodio Aluminio			
Grado de limitaciones			
para cultivos ^{perennes} anuales	ligero	fuerte	
	ligero	moderado	
para pastos	ligero	ligero	
para mecanización	fuerte	ligero	
Susceptibilidad a erosión	alta	baja	
Limitaciones para uso	pendientes	drenaje	

Cartago

Símbolo: I 16

Nombre: _____

Composición: 1. Fluvent. Humitropops 50 %
2. Aeric Tropaquepts 30 %
3. Typic Humitropops 20 %

Paisaje: Terrazas fluviales y planicies de inundación
con pendientes de 0 a 5 %

Material de partida: Aluvión

Material subyacente: Igual

Elevación: De 2 a _____ m

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes		
	1	2	3

Pendientes	0-5%	0-2%	0-3%
------------	------	------	------

Clase de drenaje	bucna	polre	bucna
------------------	-------	-------	-------

Profundidad a la roca	> 2 m	> 2 m	> 2 m
-----------------------	-------	-------	-------

Textura superficial	franca	franca	franca
---------------------	--------	--------	--------

Granulometría superficial	franca	arenosa	arenosa
---------------------------	--------	---------	---------

Fragmentos rocosos del perfil	5-20 %	< 5 %	< 5 %
-------------------------------	--------	-------	-------

Capacidad de retener agua	15-20 cm	15-20 cm	15-20 cm
---------------------------	----------	----------	----------

Permeabilidad	mod. lenta	lenta	mod. lenta
---------------	------------	-------	------------

Inundaciones Encharcamientos	comunes	raras	raras
------------------------------	---------	-------	-------

Reacción	lig. ácida	mod. ácido	mod. ácido
----------	------------	------------	------------

Saturación de bases	mod. a	mod.	mod.
---------------------	--------	------	------

Salos Sodio-Aluminio

Grado de limitaciones para cultivos ^{perennes} anuales	moderado	fuerte moderado	ligero moderado
---	----------	-----------------	-----------------

para pastos	ligero	ligero	ligero
-------------	--------	--------	--------

para mecanización	ligero	ligero	ligero
-------------------	--------	--------	--------

Susceptibilidad a erosión	baja	baja	baja
---------------------------	------	------	------

Limitaciones para uso	moderado	duro	lluvias
-----------------------	----------	------	---------

	lluvias	lluvias	
--	---------	---------	--

Símbolo: I 17

Nombre: _____

Composición: 1. Ustic Humitroppts 70 %
2. Andic Ust Humitroppts 20 %
3. _____

Paisaje: Colinas (pie de monte)
con pendientes de 5 a 30 %

Material de partida: Cenizas

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes		
	1	2	3
Pendientes	5-30%	5-30%	
Clase de drenaje	buena	buena	
Profundidad a la roca	>2 m	>2 m	
Textura: superficial suelo	arcillosa	franca	

Granulometría subsuelo: arcillosa arcillosa

Fragmentos rocosos del perfil: <5% <5%

Capacidad de retener agua: 15-20 cm >20 cm

Permeabilidad: mod. lenta mod. lenta

Inundaciones Encharcamientos: nunca nunca

Reacción: mod. ácida mod. ácida

Saturación de bases: media media

Salas Sodio Aluminio

Grado de limitaciones

para cultivos ^{perennes} anuales

moderado
ligero

moderado
ligero

para pastos

ligero

ligero

para mecanización

fuerte

fuerte

Susceptibilidad a erosión

media

media

Limitaciones para uso

pendientes
seguía

pendientes
seguía

Símbolo: _____

Nombre: _____

Composición: 1. Typic Ustropepts 40%
 2. Lithic Ustorthents 20%
 3. Vertic Ustroppts 20%

Paisaje: Llanura ondulada

con pendientes de 0 a 15%

Material de partida: Materiales aluviales, coluviales, residuales

Material subyacente: Toba

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	5-15 %	0-15 %	0-5 %
Clase de drenaje	buena	buena	moderada
Profundidad a la roca	0.5-1 m	< 0.5 m	1-2 m
Textura: superficial suelo	franca	franca	arcillosa
Granulometría subsuelo	arcillosa	(roca)	arcillosa
Fragmentos rocosos del perfil	5-20 %	5-20 %	< 5 %
Capacidad de retener agua	10-15 cm	5-10 cm	15-20 cm
Permeabilidad	mod. lenta	mod. lenta	lenta
Inundaciones Encharcamientos	nunca	nunca	nunca
Reacción	lig. ácida	lig. ácido	neutra
Saturación de bases	alta	alta	alta
Sal Sodio Aluminio	—	—	—
Grado de limitaciones perennes para cultivos anuales	fuerte moderado	muy fuerte fuerte	moderado ligero
para pastos	moderado	fuerte	moderado
para mecanización	moderado	moderado	ligero
Susceptibilidad a erosión	media	media	baja
Limitaciones para uso	seguía pendientes	profundidad seguía pendientes	seguía

1. El contacto con la roca no es
 litico en estos casos.

Símbolo: I 19

Ubicación: _____

Componentes: 1. Typic Ustropods
2. Typic Haplustals
3. Vertic Ustropods

Paisaje: _____

Material de partida: _____

Material subyacente: _____

Elevación: _____

Temperatura media anual: _____

Precipitación media anual: _____

Meses secos: _____

Componentes

Características

1

2

3

Pendientes _____

Clase de drenaje _____

Profundidad a la roca _____

Textura - suelo _____

- subsuelo _____

Fragmentos rocosos del perfil _____

Capacidad de retener agua _____

Permeabilidad _____

Inundaciones Encharcamientos _____

Reacción _____

Saturación de bases _____

Grado de limitaciones _____

para cultivos perennes _____

para cultivos anuales _____

para pastos _____

para mecanización _____

Susceptibilidad a erosión _____

Limitaciones para uso _____

Símbolo: I 20

Ubicación: _____

Componentes: 1. Fluventic Ustropepts
 2. Fluvaquentic Ustropepts
 3. Typ Ustipsamments

Paisaje: _____

Material de partida: _____

Material subyacente: _____

Elevación: _____

Temperatura media anual: _____

Precipitación media anual: _____

Meses secos: _____

<u>Características</u>	<u>Componentes</u>		
	<u>1</u>	<u>2</u>	<u>3</u>
Pendientes			
Clase de drenaje			
Profundidad a la roca			
Textura - suelo			

- subsuelo

Fragmentos rocosos del perfil _____

Capacidad de retener agua _____

Permeabilidad _____

Inundaciones Encharcamientos _____

Reacción _____

Saturación de bases _____

Grado de limitaciones

para cultivos perennes _____

para cultivos anuales _____

para pastos _____

para mecanización _____

Susceptibilidad a erosión _____

Limitaciones para uso _____

Símbolo: I 21

Nombre: _____

Composición: 1. Fluvioic Ustropods 50 %
2. Fluvent. H-plustilis 30 %
3. _____

Paisaje: Vegas (planicies de inundación)
con pendientes de 0 a 5 %

Material de partida: Aluvión

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-5 %	0-5 %	
Clase de drenaje	buena	buena	
Profundidad a la roca	> 2 m	> 2 m	
Textura: superficial superficial	franca	franca	
Granulometría subsuelo	franca	franca	
Fragmentos rocosos del perfil	< 5 %	< 5 %	
Capacidad de retener agua	15-20 cm	15-20 cm	
Permeabilidad	med. lenta	med. lenta	
Inundaciones Encharcamientos	comunes	comunes	
Reacción	lig. ácida	lig. ácida	
Saturación de bases	alta	alta	
Sal Sodio Aluminio			
Grado de limitaciones para cultivos ^{perennes} anuales	fuerte ligero	fuerte ligero	
para pastos	moderado	moderado	
para mecanización	ligero	ligero	
Susceptibilidad a erosión	baja	baja	
Limitaciones para uso	sequía inundaciones	sequía inundaciones	

Temisque

Símbolo: I 22

Nombre: _____

Composición: 1. Fluventic Ustic Dystrorops 60%
2. Typic Ustifluvents 20%
3. _____

Paisaje: Vegas (planicies de inundación)
con pendientes de 0 a 5%

Material de partida: Aluvión

Material subyacente: Igual

Elevación: De 0 a _____ m

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes		
	1	2	3

Pendientes	0-5%	0-5%	
------------	------	------	--

Clase de drenaje	buena	bueno	
------------------	-------	-------	--

Profundidad a la roca	> 2 m	> 2 m	
-----------------------	-------	-------	--

Textura superficial	franca	franca (guijarrosa)	
---------------------	--------	------------------------	--

Granulometría	franca	franca	
---------------	--------	--------	--

Fragmentos rocosos del perfil	5-20%	20-35%	
-------------------------------	-------	--------	--

Capacidad de retener agua	15-20 cm	10-15 cm	
---------------------------	----------	----------	--

Permeabilidad	mod. lenta	moderada	
---------------	------------	----------	--

Inundaciones Encharcamientos	raras	comunes	
------------------------------	-------	---------	--

Reacción	lig. ácido	lig. ácido	
----------	------------	------------	--

Saturación de bases	media	alta	
---------------------	-------	------	--

Salos Sodio Aluminio	-		
----------------------	---	--	--

Grado de limitaciones para cultivos ^{permanentes}	moderado ligero	fuerte ligero	
--	--------------------	------------------	--

para pastos	moderado	moderado	
-------------	----------	----------	--

para mecanización	ligero	moderado	
-------------------	--------	----------	--

Susceptibilidad a erosión	baja	media	
---------------------------	------	-------	--

Limitaciones para uso	sequia	sequia	
-----------------------	--------	--------	--

inundaciones
fragorosos

Símbolo: J 23

Nombre: _____

Composición: 1. Lithic Ustropods 30%
2. Lithic Ustropods 30%
3. Vartic Ustropods 20%

Paisaje: Llanura ondulada
con pendientes de 0 a 15%

Material de partida: Materiales residuales, coluviales, aluviales

Material subyacente: Toba

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-15%	0-15%	0-5%
Clase de drenaje	bueno	bueno	moderado
Profundidad a la roca	<0.5 m	<0.5 m	1-2 m
Textura: superficial suelo	franca	franca	arcilloso
Granulometría subsuelo	(roca)	(roca)	arcilloso
Fragmentos rocosos del perfil	5-20%	5-20%	<5%
Capacidad de retener agua	5-10 cm	0-5 cm	15-20 cm
Permeabilidad	mod. lenta	mod. lenta	lenta
Inundaciones Encharcamientos	nunca	nunca	nunca
Reacción	lig. ácida	lig. ácida	neutra
Saturación de bases	alta	alta	alta
Salas Sodio Aluminio			
Grado de limitaciones para cultivos ^{perennes} _{anuales}	mod. fuerte fuerte	mod. fuerte muy fuerte	moderado ligero
para pastos	fuerte	muy fuerte	moderado
para mecanización	moderado	moderado	ligero
Susceptibilidad a erosión	mod. alta	alta	baja
Limitaciones para uso	profundidad seguía pendientes	profundidad seguía pendientes	seguía

1. El contacto con la roca no es
lítico en todos los casos.
Guaricoste

Símbolo: I 24

Nombre: _____

Composición: 1. Agua Ostrokepts

2. _____

3. _____

Paisaje: _____

Material de partida: _____

Material subyacente: _____

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones	Componentes		
	1	2	3
Pendientes	_____	_____	_____
Clase de drenaje	_____	_____	_____
Profundidad a la roca	_____	_____	_____
Textura superficial	_____	_____	_____
Granulometría	_____	_____	_____
Fragmentos rocosos del perfil	_____	_____	_____
Capacidad de retener agua	_____	_____	_____
Permeabilidad	_____	_____	_____
Inundaciones Encharcamientos	_____	_____	_____
Reacción	_____	_____	_____
Saturación de bases	_____	_____	_____
Sales Sodio Aluminio	_____	_____	_____
Grado de limitaciones para cultivos	_____	_____	_____
para pastos	_____	_____	_____
para mecanización	_____	_____	_____
Susceptibilidad a erosión	_____	_____	_____
Limitaciones para uso	_____	_____	_____

Vázquez Símbolo: I 25

Ubicación: _____

Componentes: 1. Vertic Ustropepts
2. _____
3. _____

Paisaje: _____

Material de partida: _____

Material subyacente: _____

Elevación: _____

Temperatura media anual: _____

Precipitación media anual: _____

Meses secos: _____

Características	Componentes		
	1	2	3

Pendientes

Clase de drenaje

Profundidad a la roca

Textura - suelo

- subsuelo

Fragmentos rocosos del perfil

Capacidad de retener agua

Permeabilidad

Inundaciones Encharcamientos

Reacción

Saturación de bases

Grado de limitaciones

para cultivos perennes

para cultivos anuales

para pastos

para mecanización

Susceptibilidad a erosión

Limitaciones para uso

Símbolo: I 26

Nombre: _____

Composición: 1. Typic Dystrypepts 40%
2. Typic Tropepments 20%
3. Lithic Dystrypepts 20%

Paisaje: Montañas
con pendientes de 15 a 60%

Material de partida: Materiales coluviales aluviales residuales

Material subyacente: Roca saprolítica y dura

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes		
	1	2	3
Pendientes	15-60%	30-60%	45-100%
Clase de drenaje	buena	buena	buena
Profundidad a la roca	1-2 m	<0.5 m	1-2 m
Textura: superficial Suelo	arcillosa	arcillosa	franca

Granulometría subsuelo

Fragmentos rocosos del perfil

Capacidad de retener agua

Permeabilidad

Inundaciones Encharcamientos

Reacción

Saturación de bases

Sales Sodio Aluminio

Grado de limitaciones
para cultivos ^{porcentaje} _{aluviales}

para pastos

para mecanización

Susceptibilidad a erosión

Limitaciones para uso

1. El contacto con la roca no es lito en todos casos.

Cordillera de Talamanca

Parí

Símbolo: I 27

Nombre: _____

Composición: 1. Agua Dystropepts 70%
2.
3.

Paisaje: Terrazas lacustres
con pendientes de 0 a 5%.

Material de partida: Aluvión y sedimentos lacustres

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

1

2

3

Pendientes

0-2%

Clase de drenaje

imperfecto

Profundidad a la roca

>2 m

Textura: superficial
suelo

franca

Granulometría subsuelo

arcillosa

Fragmentos rocosos del perfil

<5%

Capacidad de retener agua

15-20 cm

Permeabilidad

lenta

Inundaciones Encharcamientos

nunca

Reacción

f. ácida

Saturación de bases

media

~~Sal~~ Sodio Aluminio

Grado de limitaciones

para cultivos ^{perennes} anuales

moderado

moderado

para pastos

ligero

para mecanización

ligero

Susceptibilidad a erosión

baja

Limitaciones para uso

drenaje

lluvias

acidez

Los Chiles

Símbolo: I 28

Nombre: _____

Composición: 1. Typic Humitropepts 70 %
2. Andic Humitropepts ?
3. _____

Paisaje: Terrazas
con pendientes de 0 a 15 %

Material de partida: Aluvión

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Pendientes

Clase de drenaje

Profundidad a la roca

Textura: superficial
suelo

Granulometría subsuelo

Fragmentos rocosos del perfil

Capacidad de retener agua

Permeabilidad

Inundaciones Encharcamientos

Reacción

Saturación de bases

Sal ~~Sodio~~ ~~Aluminio~~

Grado de limitaciones

para cultivos ^{perennios} anuales

para pastos

para mecanización

Susceptibilidad a erosión

Limitaciones para uso

lluvias
pendientes
acidez

fuerte
fuerte
ligero
ligero
baja
drenaje
fragmentos
lluvias

Quezada

1. Símbolo: I 2 9

Ubicación: _____

Componentes: 1. Fluventic Dystrorpts

2. Vertic Ustrosorpts

3. Fluventic Dystrorpts

Paisaje: _____

Material de partida: _____

Material subyacente: _____

Elevación: _____

Temperatura media anual: _____

Precipitación media anual: _____

Meses secos: _____

<u>Características</u>	<u>Componentes</u>		
	<u>1</u>	<u>2</u>	<u>3</u>
Pendientes	_____	_____	_____
Clase de drenaje	_____	_____	_____
Profundidad a la roca	_____	_____	_____
Textura - suelo	_____	_____	_____

- subsuelo

Fragmentos rocosos del perfil _____

Capacidad de retener agua _____

Permeabilidad _____

Inundaciones Encharcamientos _____

Reacción _____

Saturación de bases _____

Grado de limitaciones

para cultivos perennes _____

para cultivos anuales _____

para pastos _____

para mecanización _____

Susceptibilidad a erosión _____

Limitaciones para uso _____

Símbolo: I 30

Nombre: _____

Composición: 1. Lithic Dystropepts 46%
2. Typic Dystropepts 46%
3. _____

Paisaje: Montañas

con pendientes de 30 a 60 %

Material de partida: Materiales coluviales, aluviales y residuales

Material subyacente: Roca

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Pendientes

Clase de drenaje

Profundidad a la roca

Textura: superficial
suelta

Granulometría subyacente

Fragmentos rocosos del perfil

Capacidad de retener agua

Permeabilidad

Inundaciones Encharcamientos

Reacción

Saturación de bases

~~Sal~~ Sodio Aluminio

Grado de limitaciones

para cultivos ^{perennes} _{anuales}

para pastos

para mecanización

Susceptibilidad a erosión

Limitaciones para uso

Componentes

1

2

3

30-100 %

30-100 %

bueno

bueno

< 0.5 m

1-2 m

arcillosa

arcillosa

(roca)

arcillosa

5-20 %

5-20 %

5-10 cm

15-20 cm

mod. lenta

mod. lenta

nunca

nunca

f. ácido

f. ácido

media

media

muy fuerte

ligero

muy fuerte

moderado

moderado

ligero

muy fuerte

muy fuerte

muy alta

muy alta

pendientes

pendientes

profundidad
lluvias

lluvias

San Vito

Cerro de San Vito

Símbolo: I 31

Nombre: _____

Composición: 1. Oxid Dystropepts 60 %
2. Aeris Tropogrepts 20 %
3. _____

Paisaje: Llanura colinosa
con pendientes de 0 a 30 %.

Material de partida: Materiales aluviales y resaca

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-30 %		0-5 %
Clase de drenaje	bueno		pobre
Profundidad a la roca	> 2 m		> 2 m
Textura: superficial suelo	arcillosa		franco
Granulometría subsuelo	arcillosa		arcillosa
Fragmentos rocosos del perfil	< 5 %		< 5 %
Capacidad de retener agua	15-20 cm		15-20 cm
Permeabilidad	lenta		lenta
Inundaciones Encharcamientos	nunca		raras
Reacción	muy ácida		f. ácida
Saturación de bases	baja		baja
Sal Sodio Aluminio			
Grado de limitaciones para cultivos ^{perennes} para pastos	moderado bueno	moderado fuerte	muy fuerte fuerte
para mecanización	ligero	ligero	ligero
Susceptibilidad a erosión	moderada	fuerte	ligero
Limitaciones para uso	ácidez pendientes lluvias	pendientes ácidez lluvias	delgado lluvias ácidez

Llanura Aluvial

Símbolo:

Nombre:

Composición: 1. Ustic Dystrypops 70 %

2.

3.

Paisaje: Colinas escarpadas

con pendientes de 30 a 60 %

Material de partida: Materiales coluviales aluviales y residuales

Material subyacente: Roca saprolítica

Elevación:

Temperatura anual:

Precipitación anual:

Meses secos:

Características y calificaciones

Componentes

1

2

3

Pendientes

30-60 %

Clase de drenaje

bueno

Profundidad a la roca

1-2 m

Textura: superficial
suelo

franca

Granulometría subsuelo

franco

Fragmentos rocosos del perfil

5-20 %

Capacidad de retener agua

15-20 cm

Permeabilidad

med. lenta

Inundaciones Encharcamientos

bueno

Reacción

mod. ácida

Saturación de bases

media

Sales Sodio Aluminio

Grado de limitaciones

fuerte

para cultivos

moderado

para pastos

ligero

para mecanización

muy fuerte

Susceptibilidad a erosión

muy alta

Limitaciones para uso

panderoso

severa

Símbolo: 1 33

Nombre: _____

Composición: 1. Ustic Dystropepts 60 %
2. Ustic Haplustalf 20 %
3. _____

Paisaje: Terrazas antiguas

Material de partida: silte antiguo

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-5	0-5	
Clase de drenaje	bueno	bueno	
Profundidad a la roca	> 2 m	1-2 m	
Textura superficial	arcillosa	franca	
Granulometría subsuelo	arcillosa	arcillosa	
Fragmentos rocosos del perfil	< 5%	< 5%	
Capacidad de retener agua	15-20 cm	15-20 cm	
Permeabilidad	lenta	lenta	
Inundaciones Encharcamientos	nunca	nunca	
Reacción	mod. ácida	mod. ácida	
Saturación de bases	media	alta	
Sales Sodio Aluminio			
Grado de limitaciones para cultivos ^{perennes} _{anuales}	moderado	moderado	
para pastos	ligero	ligero	
para mecanización	moderado	moderado	
Susceptibilidad a erosión	ligero	ligero	
Limitaciones para uso	baja	baja	
	sequía	sequía	
	acidez		

Guamcasto

Alcarague

Micaya
Cratino

Símbolo: I 34

Nombre: _____

Composición: 1. Andic Dystropepts 70%
2.
3.

Paisaje: Colinas
con pendientes de 0 a 30%.

Material de partida: Cenizas

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones	Componentes		
	1	2	3

Pendientes	5-30 %		
------------	--------	--	--

Clase de drenaje	buena		
------------------	-------	--	--

Profundidad a la roca	> 2 m		
-----------------------	-------	--	--

Textura: superficial suelo	franca		
-------------------------------	--------	--	--

Granulometría subsuelo	arcillosa		
------------------------	-----------	--	--

Fragmentos rocosos del perfil	< 5%		
-------------------------------	------	--	--

Capacidad de retener agua	> 20 %		
---------------------------	--------	--	--

Permeabilidad	mod. lenta		
---------------	------------	--	--

Inundaciones Encharcamientos	nunca		
------------------------------	-------	--	--

Reacción	f. ácida		
----------	----------	--	--

Saturación de bases	media		
---------------------	-------	--	--

Sal. Sodio Aluminio			
---------------------	--	--	--

Grado de limitaciones para cultivos ^{perennes} anuales	ligera moderada		
--	--------------------	--	--

para pastos	ligera		
-------------	--------	--	--

para mecanización	fuerte		
-------------------	--------	--	--

Susceptibilidad a erosión	alta		
---------------------------	------	--	--

Limitaciones para uso	pendientes lluvias		
-----------------------	-----------------------	--	--

Símbolo: I 35

Nombre: _____

Composición: 1. Andic Humitropepts 50%
2. Fluventic Luvitropepts 20%
3. Andic Dystropepts 20%

Paisaje: Planicies o terrazas disectadas
con pendientes de 0 a 30%

Material de partida: Aluvión de cenizas

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-15%	0-5%	5-30%
Clase de drenaje	bueno	bueno	bueno
Profundidad a la roca	>2 m	>2 m	>2 m
Textura superficial suelo	franca	franca	franca
Granulometría subsuelo	arcillosa	franca	arcillosa
Fragmentos rocosos del perfil	<5%	5-20%	<5%
Capacidad de retener agua	>20 cm	15-20 cm	>20 cm
Permeabilidad	mod. lenta	mod. lenta	mod. lenta
Inundaciones Encharcamientos	nunca	comunes	nunca
Reacción	f. ácida	mod. ácida	mod. ácida
Saturación de bases	media	media	media
Sal Sodio Aluminio			
Grado de limitaciones para cultivos ^{perenn} anuales	ligero moderado	moderado moderado	ligero moderado
para pastos	ligero	ligero	ligero
para mecanización	moderado	ligero	fuerte
Susceptibilidad a erosión	media	baja	alta
Limitaciones para uso	lluvias pendientes	lluvias inundaciones	pendientes lluvias

Símbolo: M1

Ubicación: _____

Componentes: 1. Typic Argiustolls

2. Vertic Ustropepts

3. _____

Paisaje: _____

Material de partida: _____

Material subyacente: _____

Elevación: _____

Temperatura media anual: _____

Precipitación media anual: _____

Meses secos: _____

Características	Componentes		
	1	2	3
Pendientes	_____	_____	_____
Clase de drenaje	_____	_____	_____
Profundidad a la roca	_____	_____	_____
Textura - suelo	_____	_____	_____

- subsuelo

Fragmentos rocosos del perfil _____

Capacidad de retener agua _____

Permeabilidad _____

Inundaciones Encharcamientos _____

Reacción _____

Saturación de bases _____

Grado de limitaciones

para cultivos perennes _____

para cultivos anuales _____

para pastos _____

para mecanización _____

Susceptibilidad a erosión _____

Limitaciones para uso _____

Símbolo: M2

Ubicación:

Componentes: 1. Fluventic H-plustolls
2. Typic Argiustolls
3. Fluventic Ustropepts

Paisaje:

Material de partida:

Material subyacente:

Elevación:

Temperatura media anual:

Precipitación media anual:

Meses secos:

Características	Componentes		
	1	2	3
Pendientes			
Clase de drenaje			
Profundidad a la roca			
Textura - suelo			
- subsuelo			
Fragmentos rocosos del perfil			
Capacidad de retener agua			
Permeabilidad			
Inundaciones Encharcamientos			
Reacción			
Saturación de bases			
Grado de limitaciones			
para cultivos perennes			
para cultivos anuales			
para pastos			
para mecanización			
Susceptibilidad a erosión			
Limitaciones para uso			

Símbolo:

Nombre:

Composición: 1. Fluvaquentric Hapludolls 30 %
 2. Fluvaquentric H-plaquolls 20 %
 3. Typic Tropaquepts 30 %

Paisaje: Vegas (planicies de inundación) y terrazas costeras pantanosas
 con pendientes de 0 a 2 %

Material de partida: Aluvión

Material subyacente: Igual

Elevación: De 0 a 20 m

Temperatura anual:

Precipitación anual:

Meses secos:

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-2 %	0-2 %	0-2 %
Clase de drenaje	imperfecta	muy pobre	muy pobre
Profundidad a la roca	> 2 m	> 2 m	> 2 m
Textura: superficial suelo	franca	franca	franca
Granulometría subsuelo	franca	franca	arcillosa
Fragmentos rocosos del perfil	5-20 %	5-20 %	< 5 %
Capacidad de retener agua	15-20 cm	15-20 cm	15-20
Permeabilidad	mod. lenta	mod. lenta	lenta
Inundaciones Encharcamientos	comunes	frecuentes	raras
Reacción	mod. ácida	mod. ácida	s. ácida
Saturación de bases	alta	alta	media
Salas Sodio Aluminio	-	-	-
Grado de limitaciones para cultivos ^{perennes} anuales	moderado	muy fuerte	muy fuerte
para pastos	ligero	fuerte	fuerte
para mecanización	ligero	muy fuerte	muy fuerte
Susceptibilidad a erosión	baja	baja	baja
Limitaciones para uso	drenaje	drenaje	drenaje

Símbolo: U1

Nombre: _____

Composición: 1. ~~Ferr~~^{Oxic} Pale humults 60%
2. Acric Tropaquepts 20%
3. _____

Paisaje: Terrazas antiguas
con pendientes de 0 a 5%.

Material de partida: Aluvión antiguo

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

	1	2	3
Pendientes	0-5%	0-2%	
Clase de drenaje	bueno	pobre	
Profundidad a la roca	> 2 m	> 2 m	
Textura superficial suelo	arcillosa	arcillosa	
Granulometría suelo	arcillosa	arcillosa	
Fragmentos rocosos del perfil	< 5%	< 5%	
Capacidad de retener agua	15-20 cm	15-20 cm	
Permeabilidad	lenta	lenta	
Inundaciones Encharcamientos	nunca	comunes	
Reacción	fuertemente ácida	fuertemente ácida	
Saturación de bases	baja	media	
Salas Sodio Aluminio			
Grado de limitaciones para cultivos ^{frío}	moderado fuerte	muy fuerte fuerte	
para pastos	ligero	moderado	
para mecanización	ligero	moderado	
Susceptibilidad a erosión	baja	baja	
Limitaciones para uso	ácidez lluvias	ácidez lluvias	

Símbolo: U 2

Nombre: _____

Composición: 1. Ustoxic Pale horrofts 70%
2. Aerio Tropaepts 20%
3. _____

Paisaje: Terrazas antiguas disectadas
con pendientes de 0 a 15%

Material de partida: Aluvión antiguo

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes	
	1	2
Pendientes	0-15%	0-2%
Clase de drenaje	bueno	pobre
Profundidad a la roca	> 2 m	> 2 m
Textura superficial	arcillosa	arcillosa

Granulometría: arcillosa 210-1000

Fragmentos rocosos del perfil < 5%

Capacidad de retener agua 15-20 cm

Permeabilidad lenta

Inundaciones Encharcamientos nunca comunes

Reacción f. ácida f. ácida

Saturación de bases baja media

Salos Sodio Aluminio

Grado de limitaciones para cultivos moderado muy fuerte

para pastos moderado moderado

para mecanización moderado moderado ligero

Susceptibilidad a erosión media media baja

Limitaciones para uso sequia drenaje

acidez pendiente acidez

Símbolo: U3

Nombre: _____

Composición: 1. Plinthic Palehumults 46%
2. Typic Humitropts 46%
3. _____

Paisaje: Colinas quebradas
con pendientes de 15 a 60 %

Material de partida: Materiales coluviales, aluviales y residuales

Material subyacente: Roca saprolítica

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes		
	1	2	3

Pendientes	15-30 %	30-60 %	
------------	---------	---------	--

Clase de drenaje	bueno	bueno	
------------------	-------	-------	--

Profundidad a la roca	> 2 m	1-2 m	
-----------------------	-------	-------	--

Textura superficial Superficial	arcillosa	arcillosa	
------------------------------------	-----------	-----------	--

Granulometría ^{subsuperficial}	arcillosa	arcillosa	
---	-----------	-----------	--

Fragmentos rocosos del perfil	< 5 %	< 5 %	
-------------------------------	-------	-------	--

Capacidad de retener agua	> 20 cm	> 20 cm	
---------------------------	---------	---------	--

Permeabilidad	lenta	lenta	
---------------	-------	-------	--

Inundaciones Encharcamientos	nunca	nunca	
------------------------------	-------	-------	--

Reacción	f. ácida	f. ácida	
----------	----------	----------	--

Saturación de bases	media	media	
---------------------	-------	-------	--

Salas Sodio Aluminio: _____

Grado de limitaciones para cultivos ^{perennes anuales}	ligero moderado	ligero moderado	
--	--------------------	--------------------	--

para pastos	ligero	ligero	
-------------	--------	--------	--

para mecanización	fuerte	muy fuerte	
-------------------	--------	------------	--

Susceptibilidad a erosión	alta	muy alta	
---------------------------	------	----------	--

Limitaciones para uso	pendientes acidez	pendientes acidez	
-----------------------	----------------------	----------------------	--

Símbolo: U 4

Nombre: _____

Composición: 1. Typic Tropohumults 40%
2. Typic Humitroppts 40%
3. _____

Paisaje: Montañas
con pendientes de 15 a 60%.

Material de partida: Material coluviales, aluviales y residuos

Material subyacente: Roca saprolítica

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes		
	1	2	3
Pendientes	15-30%	30-60%	
Clase de drenaje	buena	buena	
Profundidad a la roca	> 2 m	1-2 m	
Textura superficial	arcillosa	arcillosa	

Granulometría: arcillosa

Fragmentos rocosos del perfil < 5%

Capacidad de retener agua > 20 cm

Permeabilidad lenta

Inundaciones Encharcamientos nunca

Reacción f. ácida

Saturación de bases media

Salas Sodio Aluminio

Grado de limitaciones para cultivos ^{perennes} _{anuales} ligero moderado

para pastos ligero

para mecanización fuerte

Susceptibilidad a erosión alta

Limitaciones para uso pendientes

lluvias

Símbolo: U5

Nombre: _____

Composición: 1. Typo Relo ud. ite 80%
2.
3.

Paisaje: Terrazas antiguas destruidas

Material de partida: Aluvión antiguo

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

Componentes

Pendientes

1 0-15

Clase de drenaje

2 buena

Profundidad a la roca

3 > 2 m

Textura superficial
suelo

arcillosa

Granulometría subsuelo

arcillosa

Fragmentos rocosos del perfil

< 5%

Capacidad de retener agua

15-20 cm

Permeabilidad

lenta

Inundaciones Encharcamientos

nunca

Reacción

fácida

Saturación de bases

media

Salas Sodio Aluminio

Grado de limitaciones

para cultivos ^{perennos} anuales

ligero
moderado

para pastos

ligero

para mecanización

moderado

Susceptibilidad a erosión

media

Limitaciones para uso

prohibido
ácido
lluvias

San Ramon

Quetzal

Símbolo: V1

Nombre: _____

Composición: 1. Typic Pellusterts 70 %
2. Udic Pellusterts 20 %
3. _____

Paisaje: Terrazas
con pendientes de 0 a 2 %

Material de partida: Aluvión o sedimentos marinos

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes	1	2	3
Pendientes		0-2 %	3-5 %	
Clase de drenaje		moderado	imperfecto	
Profundidad a la roca		> 2 m	> 2 m	
Textura superficial		arcillosa	arenosa	

Granulometría

Fragmentos rocosos del perfil

Capacidad de retener agua

Permeabilidad

Inundaciones Encharcamientos

Reacción

Saturación de bases

~~Sal~~ Sodio Aluminio

Grado de limitaciones para cultivos

para pastos

para mecanización

Susceptibilidad a erosión

Limitaciones para uso

Símbolo: V 2

Nombre: _____

Composición: 1. Typ. Pellosterts 40%
2. Ustic Humitropepts 20%
3. Vertic Ustropepts 20%

Paisaje: Meseta ondulada con colinas bajas y valles
con pendientes de 0 a 15%

Material de partida: Aluvión redondeado de barro y corizas

Material subyacente: Igual

Elevación: _____

Temperatura anual: _____

Precipitación anual: _____

Meses secos: _____

Características y calificaciones

	Componentes		
	1	2	3

Pendientes	0-5%	5-15%	0-5%
------------	------	-------	------

Clase de drenaje	imperfecta	bueno	moderado
------------------	------------	-------	----------

Profundidad a la roca	> 2 m	> 2 m	> 2 m
-----------------------	-------	-------	-------

Textura superficial suelo	arcillosa	arcillosa	arcillosa
------------------------------	-----------	-----------	-----------

Granulometría subsuelo	arcillosa	arcillosa	arcillosa
------------------------	-----------	-----------	-----------

Fragmentos rocosos del perfil	< 5%	< 5%	< 5%
-------------------------------	------	------	------

Capacidad de retener agua	15-20 cm	> 20 cm	15-20 cm
---------------------------	----------	---------	----------

Permeabilidad	muy lenta	mod. lenta	lenta
---------------	-----------	------------	-------

Inundaciones Encharcamientos	raras	raras	raras
------------------------------	-------	-------	-------

Reacción	lig. ácida	muy ácida	mod. ácida
----------	------------	-----------	------------

Saturación de bases	alta	media	alta
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~~Salas Sedro Aluminio~~

Grado de limitaciones para cultivos ^{perennes} anuales	fuerte	ligero	moderado
	ligero	ligero	ligero

para pastos	moderado	ligero	moderado
-------------	----------	--------	----------

para mecanización	ligero	moderado	ligero
-------------------	--------	----------	--------

Susceptibilidad a erosión	baja	baja	baja
---------------------------	------	------	------

Limitaciones para uso	textura sequia	mod. lento sequia	sequia
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